ONE-TO-ONE LAPTOP INITIATIVE: PERCEPTIONS OF TEACHERS AND ADMINISTRATORS

By

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Chapter One

Overview

Introduction

Students today live in a wired world, and most of them are adept at using computers to find information, play or upload video clips, and even create personal Web pages (Van Roekel, 2004). Today's school systems seem to be placing more emphasis on technology devices and infrastructure as an educational tool, however some schools still rely on industrial age educational models missing several opportunities to meet the growing needs of the 21st century student. Simply put, many of our approaches are out of date making it harder for educators to challenge students and hold their interest (Van Roekel, 2004, p. 1). School districts across the country are finding ways to put mobile computing devices into the hands of students. Districts are seeking to improve engagement, attendance, and attitude with technology (Bethel, Bernard, Abrami, & Wade, 2007), but they also believe it creates an opportunity for students to utilize a powerful learning tool at home (Murphy, King, & Brown, 2007). It is believed that American laptop families who join the movement to have access to some form of Internet in their homes will have a distinct economic advantage over those without this same opportunity (Silvernail & Lane, 2004).

A common denominator for success will be the ability of individual students to use technology, an imperative for students of all ability levels and all socioeconomic circumstances, to succeed in critical content coursework requiring literacy, reading and writing, proficiency, and higher orders of thinking and understanding (Baldwin, 1999; Carter, 2001; Cromwell, 1999; Guignon, 1998; Lemke & Martin, 2003; Penuel, Yarnall,

& Simkins, 2000; Rockman et al., 2000; Salpeter, 2000). It is, therefore, the responsibility of educators to initiate and determine the success of school programs that require students to prepare for the future by participating in one-to-one laptop computer learning environments that emphasize achievement, critical thinking, problem solving, communication, and self direction skills (Friedman, 2005).

Since the mid 1990s, federal, state, local agencies, and private interests have invested more than ten billion dollars to purchase hardware and integrate technology initiatives into public schools (O'Dwyer, Russell, Bebell, & Tucker-Seeley, 2005). By adding technology to the educational setting, schools are able to remove certain obstacles that impede learning. Technology is a widely acceptable tool that can improve student performance. At the end of the 20th century, it was determined that the ratio of students with access to computers and internet in public schools had reached a ratio of 7:1 (NCES, 2001). This was due to the federal government E-Rate program. An American Youth Policy Forum indicated that 98% of American schools had access to the internet due to this program (American Youth Policy Forum, 2002). With the widespread development of technology tools for education, school personnel should consider including it in academic programs as society extends learning opportunities beyond the high school campus. They should also foster teacher designed, high quality work taught in ways that engage students through appropriate professional development. Finally, reforms should include the development of a school wide strategic plan that makes technology an integral part of the curriculum, instruction, and assessment allowing for the accommodations of different learning styles and helping teachers to individualize and

improve the learning process (National Association of Secondary School Principals, 2004).

Technology is providing the potential to enhance learning literacy, and it is becoming the tool for improving student performance. Initial research has centered on how students and teachers use laptops in instructional settings. Particular interest has focused on the perceptions of teachers' and students' use toward laptop computer programs and their effectiveness (Harris & Smith, 2004; Russell, Bebell, & Higgins, 2004; Silvernail & Lane, 2004; Walker, Rockman, & Chessler, 2000; Warschauer, 2006; Warschauer, Grant, Del Real, & Rousseau, 2004). Although hundreds of studies have investigated the impact of technology on student literacy, "the evaluation literature still seems patchy" (Kulik, 2003, p. ix). Based on the current research it appears there is a need for more defined mixed method research addressing the impact of technology on student literacy.

Problem Statement

There are many variables to measure when considering whether a one-to-one laptop initiative will be successful. Boards of education must listen to many constituents and use quality data in order to make informed decisions. Some studies report that laptops could be one variable that increases student achievement (Gulek & Demirtas, 2005). More research is needed on overcoming instructional obstacles for the implementation of a successful one-to-one school laptop initiative. Greenhow, Robella, and Hughes (2009) sought to gauge the perceptions across key stakeholder groups concerning the value, effectiveness, and use of the one-to-one laptop in a classroom environment. Administrators were asked to recount observed uses of the laptop, degree

and level of use by the students, the frequency of use, purpose and overall attitude about the initiative as a workable resource offered by the school district. Teachers were asked to assess their instruction as a result of the availability of the laptop resource, including their ability to incorporate it to engage higher-level thinking.

Purpose of the Study

The purpose of this mixed method design is to examine the perceptions of Nebraska teachers and administrators participating in a one-to-one laptop environment designed to improve teaching and student learning. The results generated from this study were intended to contribute to the knowledge base regarding one-to-one laptop environments, and to aid decision makers as they consider adopting one-to-one laptop initiatives for their schools.

Research Questions and Hypotheses

The study focused on aspects of a high school one-to-one laptop program. Results indicated the perceptions of administrators and teachers as they relate to allowing students (grades 9-12) to have full-time access to a laptop computer. By surveying both stakeholder groups the following research questions were explored:

Research Question 1: What are the perceptions of administrators and teachers about the number of hours per week students use laptops for school assignments across content areas (language arts, social studies, science, and math)?

Hypothesis 1: There will be no significant differences among administrators and teachers,

Research Question 2: What are the perceptions of administrators and teachers concerning the impact of laptops on academic success across content areas (language arts, social studies, science, and mathematics)?

Hypothesis 2: There will be no significant differences among administrator's and teacher's perceptions concerning the laptops‟ effects on academic success across content areas (language arts, social studies, science, and mathematics).

Study Population

Ten school districts were selected for this study based on the Nebraska Department of Education School Finance Formula and Organization Services 2013-14 Tax Equity and Educational Opportunities Support Act (TEEOSA) (Nebraska Department of Education, 2014). From the five largest and five smallest school districts identified by the formula above, high schools in each district was chosen that have had one-to-one laptop initiatives for four years (2010-2014). If a school district chose not to participate in the study, the next highest and/or lowest school district in TEEOSA student enrollment formula was invited to participate. This process was followed until ten school districts had agreed to participate in this study.

The ten districts with laptop initiatives included all of the district's 9-12 high school students. Key points surrounding the program included: (a) 24/7 access to a laptop during school months (August – May); (b) Wireless Internet access throughout the entire school district; and (c) An extensive professional development plan, affording the faculty's access to both real-time and virtual training experiences.

The districts were of varying enrollment sizes, socio-economic status, and diversity of student population. All districts had adopted a one-to-one laptop initiative for high schools in the district and have implemented one-to-one initiatives for four or more years.

Assumptions of the Study

The study had a strong design including (a) all schools have utilized one-to-one laptop initiatives for four or more years; (b) all teachers and administrators participated in technology integration staff development; (c) all students participation and engagement improved; (d) and classroom instruction improved. Participating teachers also received ongoing instructional and technology support through classroom observations and feedback. It was assumed that all teachers accessed and participated in technology integration staff development as well as ongoing programmatic staff development regarding technology integration.

Definitions of Terms

21st century skills—21st century skills are the skills students need to succeed in work, school, and life. They included but were not limited to global awareness; financial, economic, business and entrepreneurial literacy; civic literacy, health literacy, and environmental literacy. Other 21st century skills are creativity and innovation, critical thinking, problem solving, communication and information literacy in collaboration with media literacy (Partnership for 21st Century Skills, 2011).

Formula Student Enrollment—The formula was based on the Nebraska Department of Education School Finance Formula and Organization Services 2013-14 Tax Equity and Educational Opportunities Support Act (TEEOSA) (Nebraska

Department of Education, 2014). From the five largest and five smallest school districts identified by the formula above, high schools in each district were chosen that have had one-to-one laptop initiatives for four years (2010-2014).

Free and reduced priced lunch—Children from families with incomes at or below 130% of the poverty level ($28,665 for a family of four) are eligible for free meals. Those with incomes between 130% and up to 185% of the poverty level ($40,793 for a family of four) are eligible for reduced price meals, for which students can be charged no more than 40 cents. Free and reduced priced lunch status is commonly referred to in educational literature as a standard poverty level of which to draw conclusions about socioeconomic status (United States Department of Agriculture, 2011).

Internet—The Internet refers to an interconnected worldwide network of technology systems and computer pathways for which data and information is shared for a variety of purposes by a variety of users.

Laptop computer—A laptop computer refers to a small mobile personal computer. Laptops contain various software and tools used by students and are often networked so that students may connect wirelessly to a Local Area Network (LAN).

Local Area Network—A Local Area Network (LAN) is a computer network that connects computers and devices in an identified and specific geographical area such as home, school, computer laboratory or office. They usually have high data-transfer rates, smaller geographic area and do not require telecommunication lines.

One-to-one laptop computer program—A one-to-one laptop computer program refers to providing each student with a laptop computer for both school and home 24/7

ubiquitous use and access. One-to-one laptop computer programs may be either school district provided, individual student provided, or a combination.

Pilot Program—A pilot program refers to a temporary, experimental program or project intended to test an educational theory or assumption. Pilot programs cited in this study and literature review usually contain a limited number of students, schools, teachers, and/or classrooms (Bird, 2008).

Technology—Technology refers in general to any information technology device such as computers, mobile wireless devices, systems of networks (e.g., internet, local networks), and computer software.

Technology Integration—Technology Integration is the use of technology tools in content subject areas in education thus allowing students to apply computer and technology skills to learning, problem solving and communication.

Wi-Fi—WI-FI refers to a process for wirelessly connecting electronic devices. A device is enabled with Wi-Fi, such as a computer, gaming device, smartphone, or digital audio player that connects to the Internet via a wireless Internet access point.

Limitations of the Study

This study was confined to teachers and administrators from ten school districts identified by the Nebraska Department of Education School Finance Formula and Organization Services 2013-14 Tax Equity and Educational Opportunities Support Act (TEEOSA) (Nebraska Department of Education, 2014) listed on the Department of Education, Financial Services website. The teachers and administrators were chosen from the high schools based on the TEEOSA formula for student enrollment. From the five largest and five smallest school districts identified by the formula above, high

schools in each district were chosen that have had one-to-one laptop initiatives for four years (2010-2014). If a school district chose not to participate in the study, the next highest and/or lowest school district in the TEEOSA student enrollment formula was invited to participate. This process was followed until ten school districts had agreed to participate in this study.

Significance of the Study

This study is significant because minimal research exists that compares the perceptions of the same variable (i.e., hours of use in the classroom setting and effect on quarterly grade averages) from perspectives of teachers and administrators. The results are a key consideration as school district leadership and policy makers consider either the adoption or continuance of a one-to-one laptop program. In addition, the study highlighted the relationship between laptop usage and socioeconomic status. By potentially contrasting the differences in perception about students who receive free or reduced lunch versus those who do not, educational leaders can utilize the information to discuss the benefits of leveling the academic playing field with the use of laptop technology for all students.

School personnel considering one-to-one implementation for purposes of narrowing the digital divide will have data from which to draw upon as possible predictors of how successful the implementation could be. Finally, appropriate professional development plans in technology will be developed from the outcomes of this study. Traditionally, professional development is thought of only for the purposes of retraining teachers. However, this study will show the need for addressing the training

needs of teachers and administrators as well. Meeting the reported needs of both groups provides a roadmap for a successful one-to-one laptop initiative.

Summary

After reviewing the literature, it was evident that there was a need for significant and in-depth research in the area of one-to-one learning environments. The results of this study informed the theoretical literature on the effectiveness of one-to-one learning initiatives in the public school setting. The same questions were asked of teachers and administrators to establish comparisons between teachers and administrators concerning level and effectiveness of laptop use. Therefore, educational leaders can develop an approach to engage each group appropriately in a one-to-one project. On the instructional side, school personnel may learn best practices for integrating meaningful, high-level, and technology-rich projects into the curriculum. Boards of education may also glean information about constituents' perceptions regarding the effectiveness of laptop initiatives and be able to account for this variable in a return on student investments**.**

Chapter Two

Review of Literature

Introduction

The framework of the literature review is a guideline to understanding the context of one-to-one computing. This requires framing the strategy around the history of technology in education and the perceptions of teachers and administrators. Therefore, this literature review begins with how technology has developed from a once futuristic concept into an everyday necessity.

The history of technology is an important factor in the creation of the one-to-one laptop initiative in K-12 education. The increase in computer technology during the past 50 years is incredible, especially with the Internet's development. The World Wide Web has grown from 130 sites in 1993 to nearly 450 million sites as of July 2006 (Zakon, 2007). This technological growth has become a major factor in societal living and is driving the world of education. Our current model of schooling grew out of the technologies and social practices of the industrial revolution. One way to consider the present state of schools is to contrast where we are with where we have been and where we are going. At the K-12 level, technology will continue to change what is important to learn in a variety of ways (Collins & Halverson, 2010). We are now entering the lifelong learning era of education, having experienced the apprenticeship and schooling eras (Collins & Halverson, 2010). The framework of the history of technology in this literature review will focus on the transformation of technology over the years in the areas of hardware, software and the overall architecture.

History of Technology

Hardware. The major improvements in technology were in hardware over the past 60 years. The computer started with bulky electronic tubes and then transformed into transistors in the 1950s. During the '50s and '60s big institutions and businesses used these expensive computer devices to perform complicated tasks and read responses to programs fed into the machine on manila cards (Campbell-Kelly, 2009). As time evolved from the mid-1960s microcircuits contained several transistors and became smaller and smaller and the transistors multiplied into the thousands and could fit on a silicon "chip." Then in the 1970s the microprocessor developed and held a complete computer processing unit on a chip which gave rise to the personal computer. Essentially, what once filled a room and cost as much as a mansion had been shrunk down to the size of a postage stamp and the cost of a dinner (Levy, 1997). In the Computers-in-Use Forecast report in the 1980s, computers became part of the family dynamics (Cator, 2010). When IBM introduced its IBM PC in late 1981 it set the PC industry standard that evolved into today's dominant standard. In the early 1980s a large number of home computers were sold to the consumer market. The home computers were products such as the Atari 400, Atari 800, Commodore Vic, Commodore 64 and Texas Instruments TI-99/4 (Cator, 2010). All of these products were proprietary systems that lost out when the IBM PC became the standard. These home computers had characteristics similar to video game machines and used memory cartridges to distribute some of the programs. Cator (2010) indicated the peak year was 1983 when home computers were over 50% of total PC sales.

The amount and availability of computers and handheld devices have saturated the market since 2002 (Livingston, 2006). Technology has become inexpensive and

available through the expansion of sales over the Internet and big box stores. Thanks to a free market economy and the World Wide Web, a useful computing device can be purchased for a few hundred dollars (Livingston, 2006). As technology has increased the size of the device has decreased, creating a more powerful, smaller computer for less money. In a very short amount of time the laptop computer and Personal Digital Assistants have gone from eight pounds to today's version of mere ounces and have the ability to be held in the palm of your hand (Livingston, 2006).

Software. The challenges of software were more subtle. Thomas E. Kurtz invented Basic, a simple but mighty programming language, intended for the entire undergraduate population (Campbell-Kelly, 2009). With Basic even school kids like Bill Gates could begin to write their own programs. This basic software was the start to a new world of advancing technology to where we are today. The 1990s were a boom for the technology industry. Every month there was a new cutting-edge technology to consider. Although the dot-com bust slowed things down, there were important technology trends for schools: mobile technologies, virtual learning, and data systems (Gosmire & Grady, 2007). School systems had a focus of creating an environment of technology driven curriculum. Also in the early 1990s, technology emerged with the school desktop computer labs where students could access word processing and spreadsheet applications for completing projects. Finally, school districts began to allow additional spending for the implementation of technology into the districts. Monies from the state and federal government gave school personnel the ability to create and expand the technology in the classroom. The development of technology-specific plans for schools, districts, states, and nations provided a framework for legislators to funnel large amounts of start-up

monies for infrastructure development. Due to these efforts, the person to computer ratio in the United States dropped from 125 people per computer in 1984 to 3.8 people per computer in 2004 (Madden, 2009).

In 1996, the personal digital assistant (PDA) became more prevalent to busy executives and school administrators (Keefe & Zucker, 2003). This device was much smaller than the computer and it could be used for many different applications. The Palm operating system allowed multi-function capability in a windows-like environment. Rudimentary handwriting recognition programs allowed for geographic versatility. Educational research consortia began to study this mode of learning in earnest (Keefe & Zucker, 2003). Today, many devices similar to the PDA are being used in classrooms as technology has improved tremendously over the years. The tablets have become the new PDA with many more applications that provide opportunities to bring your office to you anywhere you go.

Computer architect. Computer architect has barely evolved. The architect of a computer is the logical arrangement of subsystems that make up a computer. Nearly every machine in use today shares its basic architecture with the stored-program computer of 1945 (Campbell-Kelly, 2009).

School personnel started to utilize technology in math and science with the introduction of the graphing calculator (Keefe & Zucker, 2003). Texas Instruments developed and successfully marketed the handheld graphing technology. Students across the world began to apply math and science principles on the large graph display. A myriad of programs added functionality and the form factor was interesting to futuristic

engineers (Keefe & Zucker, 2003). This technology generated the evolution of specialized subjects in schools and created AdvancED learning possibilities.

The Apple Classroom of Tomorrow project (Keefe & Zucker, 2003) was the United States first attempt to make computers readily available to teachers and students. Powered by the Mac operating system, technology came to be viewed as a tool for learning. The Apple Classroom of Tomorrow project examined classroom management data from 32 elementary and secondary teachers in 5 school sites across the United States (Keefe & Zucker, 2003). These schools reflected a diverse student population and an environment found in contemporary public schooling. The research consisted of each site beginning with one classroom in the fall of 1986, adding classrooms, staff, and students in subsequent years. By the spring of 1989, the 5 sites included grades 1–6 and 9–12, located in communities that ranged from low socioeconomic status urban areas, to high socioeconomic status in suburban areas and middle socioeconomic status in rural areas (Haymore-Sandholtz, Ringstaff, & Dwyer, n.d.).

The findings from the Apple Classroom of Tomorrow (Keefe & Zucker, 2003) study focused on three stages, Survival, Mastery and Impact. The first stage was Survival. An important concern of teachers in the survival stage was their inability to anticipate problems. Staff perceived that they were no longer teaching and their classrooms had become technology centered and not instruction centered causing then to wonder if they were able to accomplish their main goal of teaching students the content (Haymore-Sandholtz et al., n.d.). In the second stage, Mastery, teachers started to develop a systematic approach to teaching. Teachers began not only to anticipate problems but also to develop strategies for solving them (Haymore-Sandholtz et al., n.d.). The

development of technology in the classroom created a comfortable learning environment for teachers and students.

Rather than just troubleshooting, teachers developed techniques for monitoring student work, keeping records, grading tests, developing materials, and individualizing instruction. According to Livingston (2006), it is critical for teachers to respond to the needs of their students in a ubiquitous way: "the magic numbers are 24/7 and 365" (p. 7). This has also changed the way they educated students, the classroom is not 8 to 4 and nine months out of the year. The school classroom has expanded to any environment where a person can obtain Internet access or cell phone reception during the entire school day.

The development of technological virtual classrooms through an Internet accessed device is now prevalent. These classrooms have increased the presence and prevalence of laptop computers as they have become smarter, smaller, more efficient, and multi-functional. Users rely on them for anything from writing reports to networking with a virtual friend to looking up a household recipe (Lei, Conway, & Zhao, 2007). In 2004, there were more than 800 million Internet users around the world and in two years the number ballooned to 1.1 billion, as the estimated number of world Internet users in 2009 will jump to 1.7 billion (Madden, 2009). The Pew Research Group reports a 362% increase in usage from 2000-2009 (Madden, 2009).

The amount and availability of technology devices and infrastructure has exploded in recent years. Today, the Internet is having profound effects on society, how people interact and communicate with one another, how they do business, and how they get their entertainment and recreation (International Society for Technology in Education,

2007). It is becoming evident in today's society that people need to become literate in the use of technology or risk becoming more isolated.

Today, people's online behavior represents a shift in the essential way we find ourselves participating in society (McLeod & Lehmann, 2012). Technology literate people have a fundamental approach to technology as problem solvers, understanding technological impacts, using technology to solve technological problems, and understanding that technology is the result of human innovation (International Technology Education Association, 2003). Technology is at the core of virtually every aspect of our daily lives. People must leverage it to provide engaging and powerful learning experiences and content, as well as resources and assessments that measure student achievement in more complete, authentic, and meaningful ways (Cator, 2010).

As technological devices have begun to transform school systems, the next driver in this transformation will be the advancement in digitization. Today, words, sounds, and still or moving pictures can be stored, integrated, conveyed and presented in digital media for easier use and reuse, while communication via computers and telecommunications is becoming widespread (Kirkwood & Price, 2005). Mobile access devices, such as laptops, provide our education system with the opportunity to create learning experiences that are available anytime and anywhere (Cator, 2010). With the growing importance of technology within our society, it is vital that students receive an education focused on technology literacy (International Society for Technology in Education, 2007).

Sociological Implications for Schools

The roles and processes of schools, educators, and the system itself should change to reflect the times we live in (Cator, 2010). As society gauges the current state of

schools, we will find that technology is a part of most states' student assessment systems. As school personnel continue to grow with technology, it will become a vital part of state assessment systems within the next few years as the computer-based "Next Generation Assessments" connect to the Common Core Standards (Cator, 2013).

School traditions can be generational, and people not born in the technology age may be unwilling to accept new technology as they perceive some traditions will be lost within this transition. The shear speed of the world with advancements in technology can be overwhelming. These advancements are the reason the role of technology in schools has increased. As school personnel use these new tools, they begin to transform and become more effective and engaging (AdvancED, 2013). It appears the best to be offered to students today is to focus on the social and economic realities of their worlds and allow technology to be a part of that world in an effective manner. Twenty-First Century Skills for students will include a wide spectrum of collaboration, communication, and creative thinking, all of which can be facilitated by technology (Marcoux, 2012).

Pelham, Crabtree, and Nyiri (2009) concur that the naturally occurring rates of computer access are uniquely associated with educational attainment. This suggests that the ability of today's children to participate fully in tomorrow's global economy may be enhanced by efforts to provide them with the technological tools that have so powerfully shaped the modern economic and education world (Pelham et al., 2009).

The plan to transform American education calls for applying the AdvancED technologies used in our daily personal and professional lives to improve student learning; in our educational system which needs to accelerate and scale up the adoption of effective practices, and the use of data for continuous improvement (Duncan, 2010).

The challenge for our educators is to leverage the learning sciences and modern technology to create engaging, relevant, and personalized learning experiences for all learners that mirror students' daily lives and the reality of their futures (Cator, 2010). Technology can help students take a more active role in their learning by allowing them to use different instructional tools, and it increases the opportunity of students with handicaps, by overcoming financial or logistic limitations (Kussmaul & Dunn, 1996). Whether the domain is language arts, mathematics, sciences, social studies, history, art, or music, educators should continue to consider the integration of 21st Century competencies such as critical thinking, complex problem solving, collaboration, and multimedia communication demonstrated by professionals in various disciplines (Cator, 2010).

The emphasis of technology in Nebraska schools has been minimal as is evidenced by the Nebraska Department of Education's Rule 10 on school accreditation. Today's revisions of Rule 10 have placed a major emphasis on technology in schools as it states under sub section 004.01E "educational/computer technology will be incorporated in the instructional program at the elementary, middle and secondary levels" (Nebraska Department of Education, 2012). Today, technology is emphasized across all standards and in all content areas in Nebraska's updated Rule 10. Prior to the Rule 10 update the Nebraska Department of Education revised the Rule of 89 on Distance Education and Equipment Incentives in 2007. This regulation gave Nebraska school districts the incentive to use grant dollars to improve their technological infrastructure (Nebraska Department of Education, 2007). The development of an infrastructure centered on technology for learning will free learning from a rigid information transfer model (from

book to educator to students) and enable a much more motivating intertwinement of learning about, learning to do, and learning to be (Cator, 2010).

The advancements of technology infrastructures could possibly give school personnel the opportunity to extend the learning day, week, or year. Technology could give people from all over the world the ability to share ideas, collaborate, and learn new things (Cator, 2010). In the policy brief entitled "One-to-One Computing Evaluation Consortium," O'Donovan (2009) stated "there needs to be a leadership team that looks at things through three different lenses: the lens of curriculum and content; the lens of the culture of the building; and the lens of technical needs". The curriculum and content sometimes focus too often on instructional fads, in which laptop programs are sometimes included but forget to focus on the area of curriculum and content. Whatever the instructional practice, it must support the intended curriculum culture of the building: administrators, with their leadership teams, must create a culture that is receptive to the use of laptop computers as learning tools (O'Donovan, 2009). When planning a laptop program the focus should be less on the technical bugs and more on the curriculum and content of the laptop initiative and its effects on the school's culture (O'Donovan, 2009).

One-to-One Laptop Technology

Students' minds are wired to learn differently today. Technology is applying pressure and changing the status quo of past generations. Christensen, Horn, and Johnson (2011) believes his disruptive innovation theory provides the framework for school administrators, teachers and students to migrate to a student-centric classroom with the use of technology. School personnel using laptops as a tool to enhance the curriculum and not as a primary instructional mechanism are beginning to engage today's students.'

So, what are the roles of administrators, teachers, and students in a one-to-one laptop environment?

Role of administrators in a one-to-one laptop environment. As educational leaders, we can transform our schools into places that truly meet the needs of today's learners. But first we must be willing to understand and own the tools and shifts ourselves: you cannot give away what you do not own (Nussbaum-Beach, 2006). A public school administrator's perception of one-to-one laptop technology is focused on student learning, but at what price? District and building administrators are focused on budgets and sustainability. If the program is too costly and cannot be maintained through district funding then it will fail. The administration should begin with extensive communication with the school board about their technology vision for the district and a direction on how to achieve their goals. This communication is a key element in total buy-in into a one-to-one laptop initiative.

In an article titled "Laptop Mindfield," James W. Stevens (2007) described seven questions that must be discussed openly at public board meetings.

1. Is the infrastructure in place to support what you want your teachers to do?
   The district needs to have a vision and a technology plan for two to five years out when selecting hardware and establishing the infrastructure.

2. Can you afford to do what you promised?
   Make sure there is a plan in place to pay for the program. Otherwise, you will lose credibility with your teachers and parents and the one-to-one computer program will not be a success.
3. What type of professional development will we provide to teachers and administrators?
   Professional development involves the cost of instructors, equipment, release time, training costs, and these are not one-time expenses. As staff changes and technology advances, further training will be necessary. This is a constant expense to the school district and a must for teachers to be prepared for new technology and student learning.

4. What technical support are we providing to school personnel?
   Remember the difference between software and hardware. You need someone who can teach teachers to use the software and someone who can keep the hardware that runs the software working. This is an area that can not be lost in the development of a one-to-one program.

5. What is the life expectancy of the hardware and software?
   To keep the most current technology in the hands of teachers and students is an endless task and fiscal expense. Remember: The initial expenditure is just that.

6. How can we prevent laptop abuse?
   School districts have required parents to pay for the repair or to replace computers that their children have abused or neglected. Some parents have insured the computer through their insurance company.

7. How can we police students' access to the Internet?
   There is a constant battle between pornographers who want to get to your kids and the filter companies who want to protect your kids. The price for safety can be very expensive for a school district. (p. 5)

A large-scale technology initiative boils down to capital: political, professional, and fiscal means. The big question is how much capital are you willing to spend in the pursuit of technology? (Stevens, 2007). If you are considering implementing or continuing a laptop program, it is important to recognize the importance of the site administrator in the process and the pressures that he or she will face. The principal will always have to justify the program using data, so an effective monitoring program will need to be established. This is traditionally an area where laptop programs have fallen down (Stevens, 2007).

Role of the teacher in one-to-one laptop environments. The teacher perceptions of technology and one-to-one laptops show multiple perspectives on use, motivation, effectiveness, and student achievement. Overall, the research indicates educators see value in laptop education but to be successful in integrating technology it requires ongoing professional development (Green & O'Brien, 2002). Teachers have

reported feeling pressured by communities, parents, and administrators in response to both No Child Left Behind's technology component and the National Educational Technology Standards. The shift might not be easy, but it will be rewarding as they can spend less of their time delivering one-size-fits-all lessons year after year and spend more of their time traveling from student to student to help them with individual problems (Christensen et al., 2011). Teachers will act more as learning coaches and tutors to help students find the learning approach that makes the most sense for them (Christensen et al., 2011).

Prensky (2001) defined the gap that educators face when technology is not harnessed for today's learners, as one of the biggest problems facing education today. There can be information and access gaps between digital immigrant teachers, who may speak an outdated analog language (that of the pre-digital age), and the digital native student of today. One-to-one laptop computer initiatives help transform the learning environment by enabling learners to make use of AdvancED technology tools. One of the earliest studies of one-to-one learning found that teachers perceived more empowered and spent less time lecturing, but instead created a more inquiry-based learning environment (Rockman et al., 1997).

Teachers can be reluctant to follow school initiatives involving technology even with sufficient resources (Bitner & Bitner, 2002). Teachers often perceive school and district-wide initiatives as "oversold and underused," particularly in circumstances with inadequate administrative or institutional support (Bitner & Bitner, 2002). They may quickly become frustrated by the lack of good models for lesson planning and integration and by an inability to meet their students' needs (Bitner & Binter, 2002).

If teachers use their resources wisely, they can develop an enriched curriculum through the use of the Internet. More teachers are developing their lesson plans through the use of researched based lessons found on the Internet. They are not focused on specific textbooks and making sure they are covering specific chapters. Teacher changes in classroom practice have been attributed to their initial beliefs about technology, teaching, and learning; to administrator leadership, expectations and support; to student needs; and most importantly, but perhaps not surprisingly, to an increase in personal computer use (Christensen, 2002; Garthwait & Weller, 2005; Holden, 2002).

With additional experience, training, and technical support, many teachers have expanded their use of technology to include curricular planning, problem solving, and decision making as technological equipment replaces blackboards, overhead projectors; and other traditional educational tools (Dexter, 2007). Future teachers will need the skills to work one-on-one with different types of learners as they study in a student centric way. The tools that teachers build and distribute in the facilitated networks of the future will play a key role in making learning student centric. The next generation of teachers needs to learn how to build these tools for different types of learners and operate in these new environments (Christensen et al., 2011).

Much of the 1:1 laptop classroom research to date focuses on the ways teachers use the computers and the general benefits gained as a result. Teachers primarily use productivity and research applications, such as word processors, spreadsheets, presentation software and Internet browsers on the laptops, employing it both for their instruction and for their students' research (Dunleavy, Dexter, & Heinecke, 2007). When technology is used purposefully, 1:1 technology creates classrooms where teachers are

facilitators and mentors, guiding students through learning and creation in powerful ways (Lehmann, 2012). The term student-centric technology means software that has been developed that can help students learn each subject in a manner that is consistent with their learning needs (Christensen et al., 2011). Teachers have also reported how their students' access to networked laptops leads to changes in their teaching (Dunleavy et al., 2007). They reported designing lessons that are more student-centered and constructivist, allowing for less lecturing and more facilitating or guiding students in the learning process (Dunleavy et al., 2007). Additionally, teachers reported an increased ability to receive and give rapid feedback on class and student progress allowing for more targeted remediation for students (Dunleavy et al., 2007). Computers increased a student-centered learning and project-based teaching practices stretching teachers to move away from traditional pedagogies of paper pencil tasks (Christensen et al., 2011).

Teachers should design developmentally appropriate learning opportunities applying technology instructional strategies in their classrooms to support the diverse needs of learners. Teachers can model digital age work and learning by exhibiting knowledge, skills, and work processes representative of an innovative professional in a global and digital society (International Society for Technology in Education (ISTE), 2007). They need to engage in ongoing professional development to apply technology tools to their content to develop their students' higher order skills and creativity. Teachers can increase productivity and apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities (ISTE, 2007). Today's technology enables educators to tap into resources that inspire them to provide

more engaging and effective learning opportunities for each and every student (Cator, 2010).

Computers and Internet connections are increasingly in place within classrooms, suggesting the suitability of a renewed focus on high-quality professional development and instruction (Bakia, Means, Gallagher, Chen, & Jones, 2009). A single lecture, no matter how polished, will almost certainly move too quickly for some students and too slowly for others (Kussmaul & Dunn, 1996). The best approach might be to present certain topics multiple times by using different presentation styles. Technology should be leveraged to provide access to more learning resources than are available in classrooms and connections to a wider set of "educators" outside the classroom (Cator, 2010).

Technology isn't designed to make educators obsolete, but teachers need to evolve with technology. Basically, educators today need to be creative facilitators as much as anything, and to be an effective creative facilitator means having an understanding of how technology can be a part of learning with meaning and vision (Marcoux, 2012). The possibility exists that teachers will remain in schools as one-to-one tutors rather than teaching monolithically. Computer-based and student centric learning will enable a teacher to oversee the work of more students (Christensen et al., 2011). The shift might not be easy, but it will be rewarding. Teachers will act more as learning coaches and tutors to help students find the learning approach that makes the most sense for them (Christensen et al., 2011). Technology will help drive a pedagogical teaching shift, and educators need to be at the forefront of this change.

What teachers need to understand is their expertise in critical thinking, complex problem solving, collaboration, and multimedia communication should be woven into all content areas (Cator, 2010). Marcoux (2012) believes today's world is much smaller in terms of knowledge dissemination, yet much larger in terms of knowledge investigation. The role of the educator is to be more of a facilitator and coach. The barrier to technology integration cited most often by teachers was their limited time to learn and practice technology-related skills (Bakia et al., 2009). If given the appropriate time, teachers can provide counsel and guidance to meaningful learning by helping students frame effective knowledge with technology (Marcoux, 2012). Technological tools provide the amplification to teacher's efforts and voices in viral ways that move beyond anything we have done as individuals in the past. It is the wise educational leader who understands this and creates an open leadership plan that incorporates collective action as a goal (Nussbaum-Beach, 2006).

The role of the student in a one-to-one laptop environment. Students, of course, bring a wide variety of aptitudes, backgrounds, interests, learning styles, and motivations to school systems. A major challenge for schools is to try and match the presentation of material to such a heterogeneous audience (Kussmaul & Dunn, 1996). A tremendous amount of literature expresses students' engagement levels are greater with the laptop integration (Green & O'Brien, 2002). Uses for students comprise both the organizational and instructional realms. Technology helps transform classrooms into more collaborative, engaging, dynamic and student-centered environments (Jeroski, 2003). Class participation, cognitive development, and motivation can be increased because learning can be customized to students' specific needs, interests, and learning

styles. Research suggests that students engaging in collaborative work and project-based learning have higher levels of motivation, and when motivated, demonstrate improved achievement (Guthrie & Wigfield, 2000). School districts that have balanced resources to promote a one-to-one environment report that they have integrative classroom instruction by increasing student motivation, engagement, and achievement through learning (Ferriter, 2009). Collaborative tools such as blogs, wikis, and social networking websites help students and teachers share content in much more meaningful and creative ways (Ferriter, 2009).

Many school districts have goals to implement one-to-one computer initiatives hoping to create an environment where students take more ownership of their learning and become more motivated. One-to-one programs can provide an educational environment with more student centered strategies, project-based learning, independent inquiry, cooperative or collaborative learning, and teachers serving as facilitators of learning (Grimes & Warschauer, 2008; Jeroski, 2003; Lowther, Ross, & Morrison, 2001, 2003). If you have been in education for more than ten years you know that today's children are different. Students want to feel successful and make progress, and they want to have fun with friends. Some students languish in boredom and do not experience success because they can learn much faster than the rate at which their teachers are pacing a class (Christensen, et al., 2011).

There is evidence that their brains are physiologically different as their experiences are defined within their culture, which is based on video games, social networking, and a prevailing sense of hyper-connectedness that practically makes the word goodbye obsolete (McLeod & Lehmann, 2012). It seems the technological age of

social networks is transforming our students' perceptions. There is a near-universal agreement that schools must find ways to transform older teaching practices in order to harness the tools that students have at their disposal today (McLeod & Lehmann, 2012). Our children are growing up in a world where they can launch a social movement from their laptops (Gladwell, 2009). Students in one-to-one environments have constant access to the world around them. Used purposefully, one-to-one environments create classrooms where teachers are facilitators and mentors, guiding students through learning and creation in powerful ways (McLeod & Lehmann, 2012). At its most basic, a one-to-one computing program gives students the opportunity to interact with their educational world in a way that most closely mirrors the rest of the society (Lehmann, 2012). One-to-one computing programs can help students and teachers create a learning environment that is truly transformative for all involved (McLeod & Lehmann, 2012).

Engagement of Students with One-to-one Laptop Computers

Learning using computers has become an expected and integral part of students' education (Concannon, Flynn, & Campbell, 2005). Computer users can quickly and easily access a plentitude of information on virtually any topic, and the information accessed might include text, graphics, audio, and video from multiple sources (Gayton & Slate, 2002). In addition, computer programs permit interactivity – the reciprocal interchange – between the student and the learning materials (Moreno & Valdez, 2005).

One-to-one technology initiatives have emerged as a solution to the many educational concerns in today's society. Research suggests, that providing students with unlimited laptop use expands not only their accessibility to resources, but also the amount of time students engage in their schoolwork. Increased engagement and creation of a

dynamic integrated learning environment are cited in literature as positive outcomes of one-to-one laptop initiatives (Kerr, Payne, & Barney, 2003). The combination of a strong technology infrastructure, effective staff development practices and integrated technology learning environments with high student and teacher interest and engagement, school districts are energized to transform the learning classrooms for all students with one-to-one laptop computer initiatives. This powerful finding supports the idea that more engagement with the laptop leads to better achievement and engagement by students in the process of writing (Silvernail & Lane, 2004).

Educators have used a variety of indicators to measure the achievement of students and school personnel. Researchers in some schools are measuring student engagement in learning by attendance and behavior referrals in an effort to show growth in student learning enhanced by the implementation of one-to-one computing environments (Metiri Group, 2006). School districts that have implemented one-to-one technology initiatives report that they have transformed classroom instruction by increasing student motivation, engagement, interest, and self-directed learning. Collaborative tools such as blogs, wikis and social networking websites help students and teachers share content in much more meaningful and creative ways (Ferriter, 2009).

Rockman et al. (2000) reviewed several project reports and reported the effects on teaching and learning when laptops are introduced into the school environment. In one project (Indiana's TECH-KNOW-Build Project, 2006), teachers reported, anecdotally, that students have greater engagement in their assigned work, increased motivation, fewer behavioral referrals, and higher attendance. However, analysis of achievement data and writing assessments showed few differences between one-to-one students and

students in more traditional settings. Indiana's TECH-KNOW-Build Project (2006) did find that students think that laptops help them learn and that 21st century learning skills increased. Rockman et al. (2000) suggests that the positive effects may provide enough rationale for school administrators to develop laptop programs even though achievement on standardized tests and writing assessments may not increase.

Larry Cuban (2006) has been critical and skeptical of the need for schools to adopt a one-to-one computing environment. Cuban claims that what most districts find from adopting one-to-one environments, is increased student motivation, more engagement in lessons, and increased interest in learning. Cuban states that one-to-one computing, as well as all other technology introduced in the past 80 years, has failed to show a direct link to improved test scores. According to Cuban, one-to-one supporters mistake the medium for instruction, laptops, for how teachers teach, and that instruction is responsible for achievement gains, not laptops.

Technology Standards

The International Technology Education Association (ITEA) has developed technology content standards for students. Students should develop an understanding of the relationships around technologies and the connections between technology and other fields of study (International Technology Education Association, 2000). The ITEA believes students should develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving (ITEA, 2000). Students should develop the ability to use and maintain technological products and systems, while developing an understanding of the role of society in the development and use of technology (ITEA, 2000). With a digital device in

every student's hand, school personnel can find themselves unshackled from the limits of space and schedule, allowing students to learn, create and communicate in powerful ways (Lehmann, 2012).

The ITEA's core belief is that all students must have regular opportunities to use technology to develop skills that encourage personal productivity, creativity, critical thinking and collaboration in the classroom and in daily life (ITEA, 2000). Technology must be used in ways that support curricular goals and give students opportunities to use technology in their learning. Simple access to technology is not enough to influence student academic outcomes (Bakia et al., 2009). Technology-based tools can enhance student performance when they are integrated into the curriculum and used in accordance with knowledge about learning (Bakia et al., 2009). Students can have constant access to the world around them. Resources for creating, synthesizing, researching, writing, presenting, and publishing are solidly in the hands of the learner, not distributed by the teacher (Livingston, 2006). Teachers need to learn how to work this potential into their planning and classroom management.

Interactive technologies are highly engaging to students and have the potential to motivate students to learn (Cator, 2010). Students need to learn how to find and use information effectively. The bigger issue is how to facilitate what is important to learning and teaching technology effectively (Marcoux, 2012). The ITEA believes if we want to advance digital age learning, students need to be creative, innovative, collaborative, fluent researchers, and critical thinkers, who become digital citizens and understand technology operations (ITEA, 2000). Real-world tools create learning opportunities that allow students to grapple with real-world problems and opportunities

that prepare them to be more productive members of a globally competitive workforce (Cator, 2010).

Summary

There have been many economic choices centered on technology in recent years. Some of these choices have popped up and evaporated, but it is apparent the Internet and digital tools are here to stay. The challenge is to use them wisely to transform schools in ways that help students and thus our whole society (AdvancED, 2013). If used wisely, technology can help school personnel become more relevant and engaging by applying project-based learning strategies for students to undertake meaningful projects requiring them to master reading, writing, math, science, and social studies skills (Christensen et al., 2011). This integrates the delivery of curriculum with experiences that enable students to feel successful and have fun with their friends everyday (Christensen et al., 2011). Technology can assist in providing a high quality education for all students, attract, prepare and retain high quality teachers, increase links between home and school, and help provide accountability for results (AdvancED, 2013).

The integration of technology can lead to experiences that help students learn better and faster, including test preparation activities, formative assessments, individualized instruction, and more engaging curriculum (Bakia et al., 2009). Many disabled people and teachers endorsed in special education have discovered how technology can assist them and help them better participate in education and training. Technology often is able to help learners with disabilities or communication difficulties present their work effectively and develop their confidence and motivation (Clarke, 2007). The benefits of email and computer conferencing enable dialogue between

teachers, students and colleagues through distance education. It is a valuable communication channel for students who live in remote locations, or for those who are housebound due to health, disability or domestic responsibilities (Kirkwood & Price, 2005). Since participants do not have visual or auditory contact with each other, contributions are not overtly influenced by preconceived notions or prejudices based upon accent or physical attributes (Kirkwood & Price, 2005).

Transformational change in education can not deal with the expectations of "digital native" students regarding access to and use of technology (AdvancED, 2013). This generation of children does not possess the same educational expectations as past generations. This generation of children does not value the same privacy expectations that many adults find uncomfortable with social media (Nussbaum-Beach, 2006). Educators need to focus on what and how we teach to match what people need to know, how they learn, where and when they will learn, and who needs to learn (Cator, 2010). Shirky (2008) believes the four stages to master the connected world are sharing, cooperating, collaboration, and collective action. Students need to develop an expertise in critical thinking, complex problem solving, collaboration, and multimedia communication across all content areas (Cator, 2010).

A new generation of learners is pushing the boundaries of traditional classrooms with new environments we cannot clearly describe. Online learning systems and resources have begun to collect and analyze more fine-grained information about learning processes, such as how quickly a student moves through a simulated environment or a sequence of problems; the amount of scaffolding and support the student needs; and changes in a student's response time across problems (Cator, 2013). This technology

enables students to become creators and generators of knowledge. Advances in technology promises or threatens to alter our world in ways that even the most knowledgeable among us can barely imagine (McLeod & Lehmann, 2012). Advocates of a one-to-one computer initiative argue that computers are powerful learning tools, bringing information to student's fingertips and allowing them to interact with it and synthesize it in ways that would be impossible otherwise (Pelham et al., 2009). Connected teaching enables our education system to provide access to effective teaching and learning resources where they are not otherwise available and provides more options for all learners (Cator, 2010). Technology helps school personnel execute collaborative teaching strategies combined with professional learning. These strategies better prepare and enhance educators' competencies and expertise over the course of their careers (Cator, 2010).

Chapter Three

Methodology

The purpose of this mixed method design was to examine the perceptions of Nebraska teachers and administrators participating in a one-to-one laptop environment designed to improve teaching and student learning. The results generated from this study are intended to contribute to the knowledge base regarding one-to-one laptop environments, and to aid decision makers as they consider adopting one-to-one laptop initiatives for their schools.

This study used a mixed methods (Teddlie & Tashakkori, 2009) design, which is a procedure for collecting, analyzing and "mixing" both quantitative and qualitative data at some stage of the research process within a single study, to understand a research problem more completely (Creswell, 2002). Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. Its central premise is the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone (Creswell & Plano Clark, 2007, p. 5). In using a mixed methods approach, the inquiry is fundamentally based on collecting vast types of data that combines the elements of quantitative and qualitative research approaches for the purposes of depth of understanding and corroboration (Johnson, Onwuegbuzie, & Turner, 2007).

In quantitative research, an investigator relies on numerical data (Charles & Mertler, 2002). He uses post positivist claims for developing knowledge, such as cause and effect thinking, reduction to specific variables, hypotheses and questions, use of measurement and observation, and the test of theories. A researcher isolates variables and

causally relates them to determine the magnitude and frequency of relationships. In addition, a researcher himself/herself determines which variables to investigate and chooses instruments, which will yield highly reliable and valid scores.

Alternatively, qualitative research is "an inquiry process of understanding" where the researcher develops a "complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting" (Creswell, 1998, p. 15).

In this approach, the researcher makes knowledge claims based on constructivist (Guba & Lincoln, 1982) perspectives. In qualitative research, data is collected from those immersed in everyday life of the setting in which the study is framed. Data analysis is based on the values that these participants perceive for their world. Ultimately, it "produces an understanding of the problem based on multiple contextual factors" (Creswell, 2002).

While designing a mixed methods study, four key decisions need to be involved in choosing an appropriate mixed methods design to use in a study: (a) level of interaction between the qualitative and quantitative data, (b) relative priority of the qualitative and quantitative data, (c) the timing of the collection of the qualitative and quantitative data, and (d) the procedures for mixing the data. Level of interaction refers to what extent the quantitative and qualitative data are kept independent or interact with each other. Priority refers to which method, either quantitative or qualitative, is given more emphasis in the study. Timing or implementation refers to whether the quantitative and qualitative data collection and analysis comes in sequence or in chronological stages, one following another, or in parallel or concurrently. Finally, mixing refers to the phase

in the research process where the mixing or connecting of quantitative and qualitative data occurs (Creswell & Plano Clark, 2011).

Creswell (2002) AdvancED a model of combined research methodologies called "dominant-less dominant design" (p. 57). In using this design, the researcher approached the study using a single dominant paradigm, qualitative, with a less prevailing model of the overall study drawn from a quantitative approach. The less dominant quantitative method is purposeful for two reasons: to corroborate qualitative findings, and to further investigate in detail one aspect of the study. The advantage of a model of combined methodologies is useful in triangulating findings, elaborating on results, using one method to inform the other, and extending the breadth of the inquiry (Dillman, 2000).

This study used one of the most popular mixed methods designs in educational research: explanatory sequential mixed methods design, consisting of two distinct phases (Creswell, 2002; Creswell, Plano Clark, Guttman, & Hanson, 2003). The first phase, the quantitative, numeric data was collected first, using assessment data and behavioral documentation. The goal of the quantitative phase was to identify perceptions of administrators and teachers from the five largest and five smallest Nebraska public schools that have one-to-one computer initiatives for four or more years regarding the number of hours per week students use laptops for school assignments across content areas and the effects on their quarterly grades. In the second phase, a qualitative multiple case study approach was used to collect data through individual interviews, documents, and elicitation of materials to help explain the perceptions of the effects of laptops from the five largest and five smallest Nebraska public schools that have one-to-one computer initiatives for four or more years. The visual model of the procedures for the mixed

methods design of the study is presented in Figure 1. Data collection involved collecting both quantitative and qualitative data concurrently, analyzing the information separately, then merging the two different types of data.

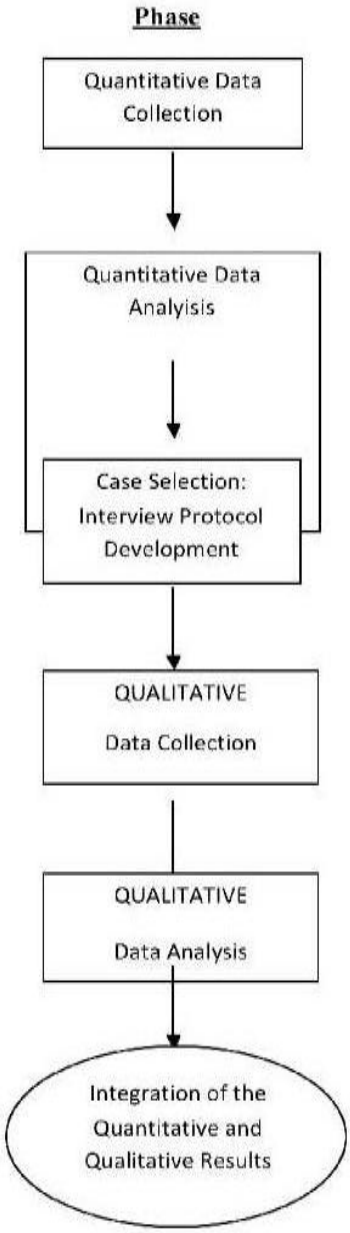

Figure 1. Mixed methods explanatory sequential design procedures.

Target Population and Sample

The target population in this study was teachers and administrators from the five largest and five smallest Nebraska public schools that have one-to-one computer initiatives four or more years. Schools of different sizes, different locations, and different computer platforms were chosen to participate. An administrator in each district was contacted to explain the research project and to invite the school to participate. All five of the largest and smallest schools were invited to participate in the research project. A total of five teachers, the high school principal, assistant principals and the superintendent of each district were identified to be interviewed for the study. If a school chose not to participate in the study, the next school in formula student enrollment was asked to be surveyed.

Data Collection

Quantitative data collection. For the purpose of collecting quantitative data, teachers and administrators from ten school districts identified by the Nebraska Department of Education School Finance Formula and Organization Services 2013-14 Tax Equity and Educational Opportunities Support Act (TEEOSA) (Nebraska Department of Education, 2014) listed on the Department of Education, Financial Services website. The teachers and administrators were chosen from the high schools based on the TEEOSA formula for student enrollment. From the five largest and five smallest school districts identified by the formula above, high schools in each district were chosen that have had one-to-one laptop initiatives for four years (2010-2014). If a school district chose not to participate in the study, the next highest and/or lowest school district in TEEOSA student enrollment formula were invited to participate. This process

will be followed until ten school districts have agreed to participate in this study. Teachers and administrators from the selected schools were asked to share their perceptions regarding implementation of the high school's one-to-one laptop initiative. Quantitative data was collected through an online survey administered to teachers and administrators of each high school. This approach provided more valid results as to the perceptions of teachers and administrators in a one-to-one laptop environment. Survey questions were open ended to provide respondents the opportunity to elaborate and follow up with information.

Qualitative data collection. Qualitative collection of data focused on determining whether the one-to-one laptop environments had a significant impact on changes in academic performance. The primary technique for collecting the qualitative data was face-to-face interviews of teachers, the high school principal, assistant principals, and the superintendent from each of the school districts to establish themes for this mixed methods research. The questions were open-ended and worded in a flexible manner to allow for in-depth discussions. The set of predetermined questions helped guide the process, but the interviews were considered exploratory. The in-depth interviews were the best technique to use when conducting an intense inquiry with a few selected individuals (Merriam, 1998). Further, research has suggested that the decision to conduct interviews should be based on the type of data needed and then determines if interviewing is the best mode to obtain that information (Merriam, 1998).

Variables in Data Analysis

The following research questions "What are the perceptions of administrators and teachers about the number of hours per week students use laptops for school assignments

across content areas (language arts, social studies, science, and math)?" and "What are the perceptions of administration and teachers concerning the positive or negative effect of laptops on quarterly grade averages across content areas (language arts, social studies, science, and mathematics)?" were measured quantitatively by collecting data from teachers and administrators who were identified as working in the five largest and five smallest Nebraska public schools that have one-to-one computer initiatives for four or more years. Each school included in the study adopted a one-to-one laptop initiative and has been in existence for at least four years with a wireless network to support the implementation. Each school was located in a community that was uniquely different from other school communities.

Quantitative data was collected from teachers and administrators in order to compare means (e.g., "Please rate the degree to having school issued laptops may have affected the last nine weeks' grade . . ."). Data were gathered by having administrators and teachers complete an online survey. In order to garner measurable and consistent results a Likert scale was used. Values were assigned in each category and relative comparisons made across both groups.

Data Analysis

In analyzing the data, the prototypical mixed methods question to be answered when merging data was as follows: To what extent, do the quantitative and qualitative results converge? Are the qualitative findings significantly related to the quantitative results? To what extent do the qualitative findings enhance the understanding of the quantitative findings? In what ways do the qualitative themes and the quantitative results converge and diverge to uncover injustice and suggest change?

Qualitative data displays were used to present the themes that emerged from the data analysis. Displays were used to present categorical strategies that break down the narrative data and rearrange the data to produce categories to show comparisons that will help lead to a better understanding of the problem (Teddlie & Tashakkori, 2009).

The steps in the qualitative analysis included: (a) preliminary exploration of the data by reading through the transcripts and writing memos; (b) coding the data by segmenting and labeling the text; (c) using codes to develop themes by aggregating similar codes together; (d) connecting and interrelating themes; and (e) constructing a narrative (Creswell, 2002).

Quantitative data was analyzed using descriptive statistics from the survey items, which was summarized in the text and reported in tabular form. Mixed methods data analysis required the researcher to determine if the results from both the quantitative and qualitative data integrate and if so, how they integrate. If the results from the two databases indicated that they were different then the researcher needed to analyze the data further to reconcile the findings (Creswell & Plano Clark, 2011).

Reliability and Validity

In quantitative research, reliability and validity of the instrument are very important for decreasing errors that might arise from measurement problems in the research study. Reliability refers to the accuracy and precision of a measurement procedure (Thorndike, 1997).

Validity refers to the degree to which a study accurately reflects or assesses the specific concept or construct that the researcher is attempting to measure (Thorndike, 1997). Content, criterion-related, and construct validity of the survey instrument was

established. Content validity showed the extent to which the survey items and the scores from these questions were representative of all the possible questions about one-to-one laptop environments to help teachers and administrators with the implementation of policies and procedures of a laptop environment.

Advantages and Limitations of the Explanatory Mixed Methods Design

The strengths and challenges of mixed methods designs have been widely discussed in the literature (Creswell, 2002; Creswell, Goodchild, & Turner, 1996; Creswell & Plano Clark, 2011; Green & Caracelli, 1997; Moghaddam, Walker, & Harre, 2003). The advantages of the design included:

1. The explanatory design's two phase structure makes it straightforward to implement, because the researcher conducts the two methods in separate phases and collects only one type of data at a time, makes intuitive sense.
2. The explanatory design is an effective design as the final report is written with a quantitative section followed by a qualitative section providing clear delineation of the research.
3. Each type of data leads itself to emergent approaches where the second phase can be designed based on what is learned from the initial quantitative phase.

Although this design is popular it also has its challenges.

The limitations of this design include**:**

1. Much effort and time is needed to implement the two phases.
2. Researchers need to consider consequences of having different sample size delineating the two different types of data.

3. It can be challenging when deciding which quantitative results need to be further explained.
4. Researchers may face questions of what to do if the quantitative and qualitative results do not agree. Contradictions can provide new insights to the topics but these differences may be difficult to resolve and may require additional data to be collected.

Research Permission and Ethical Considerations

Potential ethical issues can be found during each stage of the study. In compliance with the regulations of the Institutional Review Board (IRB) the permission for conducting the research was obtained. The Request for Review form was filed, providing information about the principal investigator, the project title and type, type of review requested, number and type of subjects. Application for research permission was contained information describing the project and its significance, methods and procedures, participants, and research status.

A consent form (Appendix A) was used to provide information regarding the participants guaranteed rights, agreement to be involved in the study, and acknowledgement of their rights are protected. A statement of informed consent was included with the web survey and reflected agreement to participate but was separate to assure anonymity of answers.

The anonymity of the participants was protected by making the survey anonymous on the web keeping all responses confidential. Participants were informed about how the summary of the data were to be disseminated to the professional

community and that the information would be presented in a way that responses would not be able to be traced back to individuals.

Role of the Researcher

In a mixed methods study, the researcher needs to have knowledge in both quantitative and qualitative research methods. In addition, the researcher needs to have an understanding for the rationales for combining both forms to ensure the correct discussion of the data collection, analysis, interpretation, and presentation.

Timing was a critical aspect of the role as a field researcher. Planning for data collection was with complete regard for the individuals who are involved with the study. Sense of timing was critical and appropriate timelines were established to allow for a balance between adequate response time and return date of information gathered from survey responses. In the interview process, timing was critical for the researcher to know when to allow for silence, when to probe for greater detail and when to change the direction of the questioning.

Mixed methods study takes additional time for extensive data collection and analyses. Time intensive nature of analyzing both text and numeric data extended beyond the time of what was required for a single method study. The researcher allowed the time needed to complete their mixed method research study.

A researcher needs to have effective communication skills in order for the study to be successful. Qualitative research tends to rely on the communication ability of the researcher. Merriam (1998) indicated two aspects that affect the nature of communication: (a) the personality of the investigator, and (b) the attitudes and orientation of the participant. As a field researcher, important aspects included having a

stance of nonjudgmental, sensitive, and respectful attitude to establish the trust and rapport necessary for good communication.

Another important form of communication involves the ability to be an active listener, which engages not only being able to interpret what is being said during the interview but also interpreting what is not being said. Interviewing is an important process to find out what in not only on someone else's mind but what is also in their mind (Patton, 1990).

One of the most significant skills required for the researcher was to be able to interpret the results that were gathered. Conclusions were derived from understanding and learning from personal experience and assertions of other researchers and educators. The researchers maintained a high level of patience, reflectivity, and willingness to see other perspectives. The qualitative research required the skill to be able to preserve the multiple realities even if the view was contradictory or different from what was actually occurring (Stake, 1995).

Differentiating the Roles of a Joint Dissertation

The focus of the joint dissertation was to examine the similarities and differences between the five largest and five smallest Nebraska public schools that had one-to-one computer initiatives for four or more years. Prior research indicated that large school districts carry a large burden of managing staff and an even larger number of students. Large school districts also have to consider the cost of starting and maintaining a one-to-one laptop initiative as stated by Ann Flynn, education technology director for the National School Boards Association, "An urban district, by the sheer number of students it serves, has concerns about scale that are typically not as much of an issue for smaller

districts" (Gordon, 2011). Another issue that exists for a large school district was its size. Flynn noted urban districts tend to have greater distance between the chief technology officer and those who actually use instructional technology. These separate reporting hierarchies often lead to "silos" and insufficient communication—a problem that can be exacerbated because employees' offices are geographically dispersed rather than centrally located (Gordon, 2011).

Budgeting for a large district to fund a one-to-one laptop initiative can be costly. For example, the Irving (TX) Independent School District sits in a high tech corridor outside of Dallas where their investment in technology was a high priority even under budget constraints (Irving, 2013). The district spent $45.4 million on technology utilizing bond propositions over the course of 15 years to alleviate general fund expenditures (Irving, 2013). Many districts do not have enough local resources so they looked at bond issues or leasing programs to offset the costs. Boston Public Schools was another example of a school district faced with a high up-front cost for its Laptops for Learning initiative (Irving, 2013). They pursued a lease purchase model, which paid a smaller amount each year with interest on the bonds for their technology initiative. This leasing model provided a means for districts to avoid the ups and downs of inconsistent school finance ensuring that a fixed amount was set aside each year for equipment.

Small schools have different challenges when it comes to implementing a laptop initiative. Their size and location can be problematic when hiring and maintaining staff with the proper expertise in technology. Small school districts want to provide their students every opportunity to excel after their K-12 grade experience. The implementation of a one-to-one technology initiative helped level the curriculum and

course offerings, which they believe gives their students more educational experiences online. For example Stidham Public Schools in Oklahoma is a district representing 120 students Pre-K through 8 Grade (Renwick, 2007). They were at the forefront of technology integration, with a 1:1 laptop program that provides every student from pre-K through eighth grade with access to a computer throughout the entire school day (Renwick, 2007). The district spent over $150,000 for the laptops and more for additional educational software, with most of the funding coming from the district's general fund budget. LeAnne Lehring, who has taught for 16 years at Stidham Public Schools, says, "This is one way that we can make sure our students are on par with students from larger public schools" (Renwick, 2007, p. 2). We believe the perception for teachers and administrators is different among small and large schools. Therefore, the focus of this joint dissertation was on the differences between the five smallest and the five largest school and the perceptions of the teachers and administrators.

Summary

This joint dissertation study was focused on ten school districts selected from the Nebraska Department of Education School Finance Formula and Organization Services 2013-14 Tax Equity and Educational Opportunities Support Act (TEEOSA) (Nebraska Department of Education, 2014). From the five largest and five smallest school districts identified by the formula above, high schools in each district were chosen that have had one-to-one laptop initiatives for four years (2010-2014). If a school district chose not to participate in the study, the next highest and/or lowest school district in the TEEOSA student enrollment formula were invited to participate. This process was followed until ten school districts agreed to participate in this study. Teachers' and administrators'

perceptions of their one-to-one laptop program was the focal point of this mixed method design. The target population in this study was teachers and administrators who were identified in one-to-one laptop environments for at least four years.

A week before the survey was available on the web participants received a notification from the researcher about the importance of their input for the study. This helped increase the likelihood of a high response rate. To decrease the response rate error and solicit a relatively high response rate, a three-phase follow-up sequence was used (Dillman, 2000). To those subjects who had not responded by the set date (a) five days after distributing the survey URL, an email reminder was sent out; (b) ten days later, the second e-mail reminder was sent; and (c) two weeks later, the third e-mail reminder was sent stating the importance of the participant's input for the study.

The quantitative data was accessed through a web-based survey design and sent to all teachers and administrators in the five smallest and five largest high schools with a one-to-one laptop initiative for four or more years who agreed to participate. One of the advantages of web-based surveys is the responses will automatically be stored in a database and can be easily transformed into numeric data through Google Docs Excel data formats. An informed consent form was posted on the web as an opening page of the survey. Participants were asked to click on the button on the site, saying "I agree to complete this survey," thus expressing their agreement to participate in the study and complete the survey.

The qualitative data showed a holistic picture with detailed reports from teachers and administrators participating in one-to-one laptop environments. The multiple case study approach gathered data through individual interviews to help explain the

perceptions of the effects of laptops in the smallest and largest public school systems in Nebraska with an initiative for four or more years. Overall, the integrated data from this mixed method study determined if, and how, the results from the quantitative and qualitative data merged.

Chapter Four

Results

Purpose

The purpose of this explanatory mixed method design study was to examine the perceptions of teachers and administrators from the five largest Nebraska public schools that have one-to-one computer initiatives for four or more years. The results generated from this study were intended to contribute to the knowledge base regarding one-to-one laptop environments, and to aid decision makers as they consider adopting one-to-one laptop initiatives for their schools. A parallel study examining the five smallest Nebraska public schools that have one-to-one computer initiatives was also conducted by Damon McDonald, allowing researchers to compare perceptions of administrators and teachers.

Research Questions and Hypotheses

The study focused on aspects of a high school one-to-one laptop program. Results reflected the perceptions of administrators and teachers as they related to allowing students (grades 9-12) to have full-time access to a laptop computer. By surveying both stakeholder groups the following research questions were explored:

Research Question 1: What are the perceptions of administrators and teachers about the number of hours per week students use laptops for school assignments across content areas (language arts, social studies, science, and math)?

Hypothesis 1: There will be no significant differences among administrators and teachers,

Research Question 2: What are the perceptions of administrators and teachers concerning the impact of laptops on academic success across content areas (language arts, social studies, science, and mathematics)?

Hypothesis 2: There will be no significant differences among administrator's and teacher's perceptions concerning the laptops effects on academic success across content areas (language arts, social studies, science, and mathematics).

Participants

The names of schools and districts for this study were acquired from the Department of Education, Financial Services website. The subjects were chosen from the formula based upon student enrollment. The 5 largest schools that have one-to-one laptop initiatives for 4 or more years were selected for the study. If a school chose not to participate in the study, the next school identified by the formula for student enrollment was asked to participate. Contact information for 107 educators was provided by the 5 largest schools with a one-to-one computer initiative for 4 or more years. The potential respondents included 10 administrators and 97 teachers. Of the 107 educators who were invited to participate in the parallel studies, 52 completed the survey (48.6% of the potential participants) (see Table 1).

Responses for teachers were organized around the 4 core teaching content areas. There were 14 responses, in the largest content area, was those who were teaching in English. Other areas represented in the survey included 11 teachers in Mathematics, 10 in Science, and 8 in Social Studies (see Table 2).

Table 1

Survey Response Rate by Educators from the Five Largest Schools

Sample	Respondents	%	Source
97	43	44.3	Teachers
10	9	90.0	Administrators
107	52	48.6	Total

Table 2

Survey Response Rate by Teacher's Content Area in the Five Largest Schools

N = 43	%	Source
14	33	English
11	26	Mathematics
10	23	Science
8	19	Social Studies

Responses for administrator were divided into two leadership areas, Superintendent and Principal. The five building administrator responses were 55.5% of the administrators surveyed and the four superintendents responses were 44.4% (see Table 3).

Key points surrounding each computer initiative included: (a) 24/7 access to a laptop during school months (August – May); (b) Wireless Internet access throughout the entire school district; and (c) An extensive professional development plan, affording the faculty's access to both real-time and virtual training experiences.

Table 3

Survey Response Rate Administrators Area Five Largest Schools

N = 9	%	Source
4	44.4	Superintendent
5	55.5	Building Adminstrator

The five largest school districts were of varying enrollment sizes, socio-economic status, and diversity of student population. All districts had adopted a one-to-one laptop initiative for high schools in their district and had implemented one-to-one initiatives for four or more years.

Findings: Phase I Quantitative Survey Results

The findings of the Phase I quantitative study for the five largest school districts are organized by the questions asked on the teacher and administrator surveys. The survey data were analyzed for significance and is noted in each description ($p < .05$).

Research question #1. Established the participant's job title in their school districts.

Research question #2. On average, how many hours per week (during school hours) do you involve student use of the school issued laptop computers?

Research question #2 results. The difference between teachers and administrators perceptions on how many hours per week students used their school issued laptop computer was not significant ($p < .05$).

Research question #3. On average, how many hours might students spend using laptops at home to complete assignments from your class?

Research question #3 results. The difference between teachers and administrators perceptions on how many hours students might spend using laptops at home to complete assignments from class was not significant ($p < .05$).

Research question #4. Please rate the degree to which students were engaged before the laptop initiative.

Research question #4 results. The difference between teachers and administrators perceptions on the degree to which students were engaged before the laptop initiative was not significant ($p < .05$).

Research question #5. Please rate the degree to which students were engaged after the laptop initiative.

Research question #5 results. A significant difference existed between teachers and administrators perceptions of the degree to which students were engaged after the laptop initiative ($p < .05$) (see Table 4). The administrators had a mean quality rating of 3.7778 (SD = .44096), whereas the teachers had a mean rating of 3.4651 (SD = .63053). The administrators had a significantly higher mean rating than the teachers in the perception of student engagement after the laptop initiative.

Table 4

Comparison of Student Engagement after Laptop Initiative

F	Sig.	t	df	2-tailed
5.273	.026	-1.412	50	.164

Research question #6. Please rate the degree to which you believe school issued laptops may have affected your students' last nine weeks' grades in your content area.

Research question #6 results. The difference between teachers and administrators perceptions on how the school issued laptops affected the students last nine weeks grades was not significant ($p < .05$).

Research question #7. How often do you incorporate the use of laptops with lecture in your classroom?

Research question #7 results. The difference between teachers and administrators perceptions on how often teachers incorporated the use of laptops with lectures in your classroom was not significant ($p < .05$).

Research question #8. How often do you incorporate the use of laptops with classroom discussion?

Research question #8 results. A significant difference existed between teachers and administrators perceptions of the degree to incorporate the use of laptops with classroom discussion ($p < .05$) (see Table 5). The administrators had a mean rating of 4.8889 (SD =.78174), whereas the teachers had a mean rating of 3.2857 (SD = 1.81169). The administrators had a significantly higher mean rating than the teachers in the degree to incorporate the use of laptops when using discussion activities in the classroom.

Research question #9. How often do you incorporate the use of laptops with the following activities in your classroom memorization exercises?

Research question #9 results. The difference between teachers and administrators perceptions on how often teachers incorporate the use of laptops with memorization exercise was not significant ($p < .05$).

Table 5

Comparison of the Degree to Incorporate the Use of Laptops in Your Classroom Discussion

F	Sig.	t	df	2-tailed
9.614	.003	-2.587	49	.013

Research question #10. How often do you incorporate the use of laptops with drill practice assignments in your classroom?

Research question #10 results. A significant difference existed between teachers and administrators perceptions of the degree to incorporate the use of laptops with drill practice assignments ($p < .05$) (see Table 6). The administrators had a mean rating of 5.5714 (SD =.53452), whereas the teachers had a mean rating of 4.5349 (SD = 1.88160). The administrators had a significantly higher mean rating than the teachers.

Table 6

Comparison of the Degree to Incorporate the Use of Laptops with Drill Practice Assignments Activities in Your Classroom

F	Sig.	t	df	2-tailed
4.951	.031	-1.437	48	.157

Research question #11. How often do you incorporate the use of laptops with in-class research?

Research question #11 results. A significant difference existed between teachers and administrators perceptions of the degree to incorporate the use of laptops with in-

class research ($p < .05$) (see Table 7). The teachers had a mean rating of 6.1395 (SD = .2.52211) whereas the administrators had a mean rating of 6.0000 (SD = .0000). The teachers had a significantly higher mean rating than the administrators in the degree to incorporate the use of laptops with drill and practice assignments in the classroom.

Table 7

Comparison of the Degree to Incorporate the Use of Laptops with In-class Research Activities in Your Classroom

F	Sig.	t	df	2-tailed
12.798	.001	.145	48	.885

Research question #12. How often do you incorporate the use of laptops with in-class reading?

Research question #12 results. A significant difference existed between teachers and administrators perceptions of the degree to incorporate the use of laptops with in-class reading ($p < .05$) see Table 8. The administrators had a quality rating of 5.5556 (SD=.52705), whereas the teachers had a mean rating of 4.3721 (SD= 2.25751). The administrators had a significantly higher mean rating than the teachers with the perception to incorporate the use of laptops for in-class research in the classroom.

Research question #13. How often do you incorporate the use of laptops with in-class writing?

Research question #13 results. A significant difference existed between teachers and administrators perceptions of the degree to incorporate the use of laptops with

Table 8

Comparison of the Degree to Incorporate the Use of Laptops with In-class Reading Activities in Your Classroom

F	Sig.	t	df	2-tailed
10.258	.002	-1.552	50	.127

in-class writing ($p < .05$) (see Table 9). The administrators had a mean rating of 5.7143 (SD =.48795), whereas the teachers had a mean rating of 5.5476 (SD = 2.62448). The administrators had a significantly higher mean rating than the teachers did with the perception to incorporate the use of laptops for in-class writing in the classroom.

Table 9

Comparison of the Degree to Incorporate the Use of Laptops with In-class Writing Activities in Your Classroom

F	Sig.	t	df	2-tailed
20.315	.000	-1.66	47	.869

Research question #14. How often do you incorporate the use of laptops with projects involving problem solving in your classroom?

Research question #14 results. A significant difference existed between teachers and administrators perceptions of the degree to incorporate the use of laptops with projects involving problem solving ($p < .05$) (see Table 10). The administrators had a

mean quality rating of 5.7778 (SD = .44096), whereas the teachers had a mean rating of 4.75 (SD = .2.00959). The administrators had a significantly higher mean rating than the

Table 10

Comparison of the Degree to Incorporate the Use of Laptops with Projects Involving Problem Solving Activities in Your Classroom

F	Sig.	t	df	2-tailed
11.969	.001	-1.514	47	.137

teachers with the perception to incorporate the use of laptops for projects involving problem solving activities in the classroom.

Research question #15. How often do you incorporate the use of laptops with projects involving analysis of data activities in your classroom?

Research question #15 results. A significant difference existed between teachers and administrators perceptions of the degree to incorporate the use of laptops with projects involving analysis of data ($p < .05$) (see Table 11). The administrators had a mean quality rating of 6.0000 (SD = .00000), whereas the teachers had a mean rating of 4.9268 (SD = 1.91560). The administrators had a significantly higher mean rating than the teachers regarding the use of laptops for projects involving analysis of data in the classroom.

Table 11

Comparison of the Degree to Incorporate the Use of Laptops with Projects Involving Analysis of Data Activities in Your Classroom

F	Sig.	t	df	2-tailed
28.838	.000	-1.667	48	.102

Research question #16. How often do you incorporate the use of laptops with ability to create an original product in your classroom?

Research question #16 results. A significant difference existed between teachers and administrators perceptions of the degree to which teachers incorporate the use of laptops with the ability to create an original product ($p < .05$) (see Table 12). The teachers had a mean quality rating of 5.5814 (SD = 2.15177) whereas the administrators had a mean quality rating of 5.8750 (SD =.35355). The teachers had a significantly higher mean rating than the administrators regarding the use of laptops for the ability to create an original product in the classroom.

Table 12

Comparison of the Degree to Incorporate the Use of Laptops with the Ability to Create an Original Product in Your Classroom

F	Sig.	t	df	2-tailed
39.673	.000	-.382	49	.704

Research question #17. How prepared are your students in using technology for communication?

Research question #17 results. The difference between teachers and administrators perceptions on how prepared students were in using technology for communication was not significant ($p < .05$).

Research question #18. How prepared are your students in using technology for expressing themselves artistically?

Research question #18 results. A significant difference existed between teachers and administrators perceptions of the degree to which teachers incorporate the use of laptops with the ability to create an original product ($p < .05$) (see Table 12). The teachers had a mean quality rating of 5.5814 (SD = 2.15177) whereas the administrators had a mean quality rating of 5.8750 (SD =.35355). The teachers had a significantly higher mean rating than the administrators regarding the use of laptops for the ability to create an original product in the classroom.

Table 13

Comparison of the Degree to Observe How Prepared are Students in Using Technology for Expressing Themselves Artistically

F	Sig.	t	df	2-tailed
8.365	.006	1.040	44	.304

Research question #19. How prepared are your students in using technology for working with others collaboratively?

Research question #19 results. The difference between teachers and administrators perceptions on how prepared students were in using technology for working with others collaboratively was not significant ($p < .05$).

Research question #20. How prepared are your students in using technology for research?

Research question #20 results. The difference between teachers and administrators perceptions on how prepared students were in using technology for research was not significant ($p < .05$).

Research question #21. How prepared are your students in using technology for analyzing and problem solving?

Research question #21 results. The difference between teachers and administrators perceptions on how prepared students were in using technology for analyzing and problem solving was not significant ($p < .05$).

Research question #22. How prepared are your students in using technology for evaluating online resources?

Research question #22 results. The difference between teachers and administrators perceptions on how prepared students were in using technology for evaluating online resources was not significant ($p < .05$).

Research question #23. On average, how many hours per week do you spend with school-issued laptops doing email?

Research question #23 results. A significant difference existed between teachers and administrators perceptions of how many hours per week they spend with school-issued laptops doing email ($p < .05$) (see Table 14). The administrators had a mean rating of 2.2222 (SD =.1.48137), whereas the teachers had a mean rating of 2.0000 (SD = 1.01212). The administrators had a significantly higher mean rating than the teachers regarding how many hours per week they spent with school-issued laptops using email.

Table 14

Comparison of the Degree to Observe How Many Hours Per Week Teachers and Administrators Spend with School-issued Laptops Doing Email

F	Sig.	t	df	2-tailed
4.121	.048	-.549	49	.586

Research question #24. On average, how many hours per week do you spend with school-issued laptops doing social networking activities?

Research Question #24 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops with social networking was not significant ($p < .05$).

Research question #25. On average, how many hours per week do you spend with school-issued laptops doing instant messaging?

Research question #25 results. The difference between teachers and administrators perceptions on how many hours per week students spend with school-issued laptops doing instant messaging was not significant ($p < .05$).

Research question #26. On average, how many hours per week do you spend with school-issued laptops in using chat rooms?

Research question #26 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops in using chat rooms was not significant ($p < .05$).

Research question #27. On average, how many hours per week do students spend with school-issued laptops doing blogging activities?

Research question #27 results. A significant difference existed between teachers and administrators perceptions about how many hours per week students spend with school-issued laptops doing blogging activities ($p < .05$) (see Table 15). The administrators had a mean quality rating of 1.5556 (SD = 1.13039), whereas the teachers had a mean rating of 1.2381 (SD = .57634). The administrators had a significantly higher mean rating than the teachers of how many hours per week they spend with school-issued laptops blogging.

Table 15

Comparison of the Degree to Observe How Many Hours Per Week Teachers and Administrators Spend with School-issued Laptops Doing Blogging Activities

F	Sig.	t	df	2-tailed
7.651	.008	-1.239	49	.221

Research question #28. On average, how many hours per week do you spend with school-issued laptops doing mobile blogging activities?

Research question #28 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops doing mobile blogging activities was not significant ($p < .05$).

Research question #29. On average, how many hours per week do you spend with school-issued laptops gaming online?

Research question #29 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops gaming online was not significant ($p < .05$).

Research question #30. On average, how many hours per week do you spend with school-issued laptops voice chatting?

Research question #30 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops voice chatting was not significant ($p < .05$).

Research question #31. On average, how many hours per week do you spend with school-issued laptops making and sharing movies?

Research question #31 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops making and sharing movies was not significant ($p < .05$).

Research question #32. On average, how many hours per week do you spend with school-issued laptops making and sharing photos?

Research question #32 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops making and sharing photos was not significant ($p < .05$).

Research question #33. On average, how many hours per week do you spend with school-issued laptops creating digital music?

Research question #33 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops creating digital music was not significant ($p < .05$).

Research question #34. On average, how many hours per week do you spend with school-issued laptops doing podcasting activities?

Research question #34 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops doing podcasting activities was not significant ($p < .05$).

Research question #35. On average, how many hours per week do you spend with school-issued laptops internet surfing?

Research question #35 results. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops internet surfing was not significant ($p < .05$).

Research question #36. On average, how many hours per week do you spend with school-issued laptops listening to music?

Research question #36 results. The difference between teachers and administrators perceptions on how many hours per week do they spend with school-issued laptops listening to music was not significant ($p < .05$).

Findings: Phase II Qualitative Data

The qualitative phase of the explanatory mixed-method study was designed to provide further examination of results and assist in the explanation of the findings. The overarching research question was, "How do administrators and teachers perceive the one-to-one laptop initiative?"

Participants. Qualitative data was collected in Phase II of the study through personal interviews with 43 teachers and 9 administrators who had given consent to be interviewed and who were selected by the researchers.

Data analysis procedures. Data was organized, prepared for analysis, and then read as a whole in order to gain a general impression of what respondents were saying and how it related or did not relate to the quantitative portion of the study. As the interview protocol was intentionally aligned with the Phase I survey, the primary themes identified through the qualitative analysis were aligned based on interview data. The strategy of aligning the Phase II interview protocol with the Phase I survey paralleled the explanatory mixed methods design selected for the study. After review and reflection, five areas were determined to be the major themes for the qualitative portion of the study: (a) perceptions of teachers/administration of the one-to-one implementation, (b) perceptions of student engagement, (c) perceptions of student grades, (d) benefits of one-to-one technology, and (e) perceptions of continued success of one-to-one initiatives (see Table 16).

Table 16

Themes for a Qualitative Study From the Interview and Open-ended Items From the Survey

1.	Perceptions of teachers/administrators of the implementation
2.	Perceptions of student engagement
3.	Perceptions of student grades
4.	Benefits of one-to-one technology
5.	Perceptions of continued success of one-to-one initiatives

Qualitative Research is subjective and the researchers worked to validate their findings through the use of thorough and complete review of survey comments, field notes, and interview scripts, keeping in mind any personal biases that they may individually or collectively have. Both researchers in the parallel study have served in the teacher, principal, and superintendent role and both have also implemented and led a one-to-one computer initiative in a school district. These perspectives, although related to the heart of the study, have been bracketed throughout the research process to ensure that they do not skew the perspective in reviewing and reporting study results (see Table 17).

Phase II: Qualitative theme for administrators. The themes of the Phase II qualitative study for the five largest school districts are organized by the questions asked of both the administrators and the teachers. The interview data were analyzed for codes establishing the appropriate themes for the qualitative responses.

Theme I: Perceptions of administrators of the one-to-one laptop implementation. The responses revealed all administrators included in the study believed the implementation of the one-to-one laptop initiative was to put technology in the hand of the students. The administration wanted to help facilitate learning and provide tools and opportunities for students to become technologically competent. Administrators and teachers believe that implementation of the one-to-one initiative would also level the playing field for many students that couldn't afford their own laptop. One administrator said,

Table 17

Themes and Codes from Interviews of Administrators and Teachers

1.	Perceptions of teachers/administrator of the implementation	
	a. Instructional purpose	19
	b. Level playing field	12
	c. Give opportunities to students	11
	d. Use technology outside the classroom	10
	e. Technology integration	6
2.	Perceptions of student engagement	
	a. Student learning	13
	b. Access to the internet	11
	c. Student motivation	10
	d. Improved communication	6
	e. Connect with the students	5
3.	Perceptions of student grades	
	a. Use as a tool	21
	b. More engaged for learning	13
	c. Aware of assignments	11
	d. A resource	10
4.	Benefits of one-to-one technology	
	a. Student engage	27
	b. Digital citizenship	17
	c. Faster paced	9
	d. Enrichment of curriculum	8
	e. Supplementary instruction	7
5.	Perceptions of continued success of one-to-one initiatives	
	a. Worth implementing	25
	b. Best for students	13
	c. Financial implications	12

> I really think its twofold: one I believe they see it as leveling the playing field for all kids, giving kids the resources, the equipment with the ability to do the same things that maybe some more AdvancED kids can do outside of the classroom that might not have access to that and then the second, I think it was a movement of our district, to incorporate technology skills into our curriculum to enhance instruction.

It is clear through the comments of administrators that the implementation of the one-to-one laptop initiative was very important for their school district. In all districts interviewed, they spoke about renewing the lease to continue to benefit from the initiative. "We are in our tenth year of a one-to-one initiative, after a decade in the system, the idea of bringing in technology was to have a laptop available to teachers and students to help facilitate learning."

A summarizing comment that portrayed the sense of administrators' beliefs and perceptions about the one-to-one computer initiative by an administrator was: "without the initiative, it is impossible to give every student the same tools to utilize during their high school career." Overwhelmingly the administrators understood the one-to-one laptop initiative was a tool for all students regardless of economic status that could be utilized to enhance instruction and learning.

Theme II: Perceptions of student engagement. Every administrator interviewed commented about how the one-to-one laptop initiative increased student engagement. Technology is part of the world we live in. "This is the world that the students live in, this is the world they want to participate in so they're engaged. When students are engaged, then they're achieving more in class." The comments were very strong for the increased focus of the students using the laptops as a tool for learning.

> I think there's kind of a renewed emphasis on technology integration in the classroom for the coming year and again. It's not to use technology for the sake of using technology, technology is a tool that will help facilitate learning and engagement and ultimately lead to stronger student achievement.

Administrators indicated that they have observed an increase in engagement and student participation with the implementation of the one-to-one initiative. One administrator shared,

> After a decade in the system, the idea to bring in the technology was to have a tool available to teachers and students to help facilitate learning especially like those twenty-first century types of schools to enhance engagement and to provide students with the opportunities to become more technologically competent.

Another said,

> The engagement of the students using the laptops was a strong topic among the administrators. "The technology is the tool that helps to engage students and they know there is kinesthetic research, that way students are engaged in the classroom and when they're engaged in the concept then their achievement will be higher."

In summarizing, administrators who have implemented one-to-one technology initiatives reported they have transformed classroom instruction by increasing student motivation, engagement, and interest. If a connection can be made between the quality of work and engagement of students and laptop computers, it is logical that students using current technology would be more likely to produce more and higher quality of work.

Theme III: Perceptions of students' grades. Administrators perceive the impact of the one-to-one initiative had little effect on student grades. Of the nine administrators that were interviewed, all of them thought the laptops didn't have a direct effect on grades but did have an effect on student participation and engagement. One administrator indicated," I don't know that the use of the technology specifically has had a big impact on the actual grades for the students. I think it has improved our communication process with the students and school work." Another Administrator said, "I don't have any

quantitative data as to how it has affected the grades; however, I feel very confident that the one-to-one has positively affected the students' learning."

Other administrators interviewed revealed that the focus on students' grades improved because the one-to-one initiative was used as a tool for teaching and learning. "The technology is the tool that helps to engage students and students are engaged in the classroom and when they're engaged in the concept then their achievement will be higher." Comments like these relate to the actual laptop being used as a tool for learning and not necessarily a means for improving student grades.

Theme IV: Benefits of one-to-one technology. Eight of nine administration interviewed offered comments relating to creating an environment for all students to use the laptops. "I think it definitely leveled the playing field for students with different socioeconomic backgrounds. These are the technologies that are expected for students to know when they go to college." Another administrator stated

> I believe schools see it as leveling the playing field for all kids, schools are giving kids the resources, the equipment, and the ability to do the same thing that maybe some more AdvancED kids can do outside of the classroom that might not have access to a laptop.

The benefits are more than leveling the playing field for all children. The one-to-one computers create an opportunity to develop technological skills for the future. Teaching with technology is more efficient. Administrators believed that it was helping prepare the students for what they're going to be seeing in the future and technology is a part of their world regardless of what sort of occupation the student decides to focus on.

Another Administrator interviewed indicated,

> There was movement in our district to really incorporate just technological skills into our curriculum, having kids work with things such as Google, and being familiar with the Google Drive and different types of things that they can do that are web-based and really using it as a tool in the classroom to enhance instruction.
>
> Administrators not only see the benefits for the students but also the staff.

Teachers developed new ways to incorporate laptops and different programs into the their classrooms. When asked about the different types of activities teachers incorporated into the classroom the responses were interesting.

> One administrator said,
>
> I think first and foremost is that supplementary instruction and learning resources are available for kids outside of the classroom. So really extending the classroom; it has provided the opportunity for our teachers to even film themselves, to post lectures, to create links to resources such as Kahn Academy that directly align to the lesson that they're teaching.

Another stated, "They've had to rethink a lot of the things that they do. The big change, I believe, is probably that teachers have found out that teaching in a digital environment is more effective if they hand over a great deal of the responsibility to the students." The focus of a teacher led classroom is changing by creating student leaders through shared technologies and learning.

Theme V: Perceptions of continued success of one-to-one initiatives. The continued success of the one-to-one initiative relies on many different sources. Some examples are: financial cost to school districts to maintain and expand the infrastructure, committed school boards to the one-to-one initiative and staff development. Administrators interviewed believed the one-to-one initiative was worth implementing, "We try to frame all of our decisions around what's best for kids and I think data shows our one-to-one initiative is providing the technology for our students is what's best for our kids." Another said, "We see the value in it, we see where it could grow to, and

we're investing our resources, like into the professional development for the staff so it is better utilized than it has been in the past."

Other administrators reported they were worried about sustainability. The cost to finance a one-to-one initiative is very expensive to maintain and requires a great deal of technical support. One administrator emphasized "You know, that $330,000 that we spent to put a laptop in every kid's hand, could have equipped a couple of amazing computer labs within our district that kids would have had access to all day long." Another administrator gave advice on how to implement a successful one-to-one initiative,

> My advice to anyone implementing is to, set up a three or four-year plan. Identify the structures that you need to be successful three or four years prior, do some programming, do some education with both the students, parents and teachers. That will make it much more successful right off the bat.

Administrators do believe that a one-to-one computer initiative is important for kids. It's vital to have the financial backing to keep the initiative moving in the right direction.

Phase II: Qualitative theme for teachers.

Theme I: Perceptions of teachers about the one-to-one implementation process.

The perceptions of the teacher on the implementation process was different then the administration. Twenty teachers interviewed commented about the implementation of the one-to-one initiative. These comments varied widely, with teachers having both positive and negative perceptions. Teachers said the implementation was driven from the top down. "It was superintendent driven through writing grants to help fund the laptops and pushing for the program to be implemented." Another stated.

> The school board saw that other districts around them were starting a laptop initiative and they didn't want to be left out. The board instructed the superintendent to look into the cost and implementation of a laptop program. Once the board and the administration had a plan it was implemented in our school.

However, one teacher described the implementation as a one-to-one laptop initiative for teachers. The teachers were given a laptop to utilize for the first year before the students received theirs. The students could access various computers in the classroom but they did not have their own. This gave the teachers time to develop and learn how to utilize the technology before the students were issued their laptops. Another teacher stated,

> The laptop initiative started as carts of laptops that classrooms could use. The students didn't have their own. In the course of six years the demands on the laptops increased to where there was a need to have the students have their own laptops.

Still another teacher spoke of how his school district took two years to research other schools that had a one-to-one initiative. The teachers were involved in the decision making and were included in the committees that toured other schools. After the two years of researching different schools his school was ready to implement the one-to-one laptop initiative.

Theme II: Perceptions of student engagement. The responses on student engagement varied from teachers utilizing laptops for learning and student collaboration to some teachers did not allow students to have their laptops open if their grade wasn't high enough.

A teacher that utilizes the one-to-one laptop shared,

> Engagement begins and ends with the lessons and activities designed by the teacher. Computers, if used well, can make said lessons more engaging, but that is all dependent on the lesson or activity. Simply adding a computer doesn't guarantee higher levels of engagement.

Another teacher said,

> It gives me access to monitor how much time and effort students are putting into learning the concepts I am trying to teach. Students learn quickly that everything is specialized for them and they cannot copy from their neighbor. They have become more accountable. The laptop does not replace teaching, it just makes it easier to monitor individual student progress and for each student to have quicker feedback.

One teacher did not think the one-to-one laptop initiative has improved student engagement in their classroom. "The laptop has become a nuisance." A math teacher has a different opinion as he believed that the engagement decreases when laptops are used.

> Engagement decreases because it's hard for the students to focus on math, the one-to-one has lowered the engagement level in math. I don't use the laptops for assignments or my lessons. In math I need to see how students work out the problem. If my students don't have at least an 80% they cannot use their laptops in class.

Theme III: Perceptions of student grades. The perception that student grades will increase due to the use of the one-to-one laptop initiative was seen by some teachers as false. The laptops are designed as a tool to use and provide access for research and collaboration among students and staff. One teacher said," There is an increase in student grades and the teachers have the ability to communicate with students for better individualized instruction in larger classes, especially effective for classes with students involved in activities." Another said, "Laptops are a tool like anything else, like a textbook or a pencil. Students have more organized information at their fingertips and will get better grades because they are using the laptops as tools."

One teacher explained how the one-to-one initiative has not affected the grades of students.

> In my content area of English the laptops have not affected the grades. I still teach the same way I taught before the initiative. The students use the laptops for writing and research, in other classes they may use them differently but I want to know what the students are thinking not what they can find on the internet.

Another has mixed feelings,

> I have mixed feeling on the effects of the laptop on student grades, I'm a big proponent of penmanship and with laptops that becomes a lost art. The students have been able to utilize the laptop as a support for their learning, but it also has been a distraction. I don't believe the laptop has had an effect on the students' grades.

Theme IV: Benefits of one-to-one technology. Teachers have many different thoughts on the benefits of the one-to-one laptop initiative in schools. There is a wide range of views that teachers have about the benefit of computers. A teacher said,

> Students have immediate contact with an instructor 24/7; they have access to classroom materials at their fingertips. They also are becoming more prepared for a technological world. As for the teachers, time has changed, we need to increase our instruction of appropriate use of technology at school.

Another teacher stated,

> I really like to tell the students they have no excuse. A good thing you can tell them is the one-to-one laptop can keep them organized, they can set up a calendar, email teachers, and communicate with other students. It helps them manage their time more efficiently.

The laptop is a tool that if used appropriately should help students and staff become more effective learners and teachers.

Technology is already a big part of our students' lives. The student's utilization of the technology can be improved through teachers immersing their student with new ways of learning. A teacher shared,

> Certainly they are already immersed in the technology, but schools are giving the students more practical experience on how to use technology for more than gaming. Schools are teaching student how to use the technology skill for research and managing their time.

The benefits shared about the one-to-one laptop initiative were that the majority of teachers reported that students are able to process information at a more critical level.

Theme V: Perceptions of continued success of one-to-one initiatives. Successful one-to-one programs should pay special attention to implementation, training, hardware and software. The infrastructure of a system will make the difference in the continued success of the program as shared by this teacher.

> It is important to think ahead and have a plan to keep the laptops updated because that cost is expensive. It was also difficult to understand that there are students that do not value the fact that the district is allowing them to use a $1000 piece of equipment and breakage was an issue.

Another teacher emphasized, "It's just another tool, a very expensive tool, that we offer to students in order to further promote their learning. The cost for maintaining a one-to-one is real expensive." Another teacher indicated," I have talked to the Superintendent about continuing the program and he believes the district needs to budget every year for updates to the servers and increased bandwidth."

Other teachers still focus on the one-to-one laptop as the tool to use to reinforce the teaching skills in the classroom. "We need to keep improving. The technology will be in the students' lives well after high school. We are preparing the students for the real world with technology. Technology will never go away."

Summary

This chapter presented the results of an explanatory mixed method design based on the two research questions concerning amount of time spent with laptops in core

curriculum as well as perceptions of the effects on academic success. Descriptive statistics were presented for a comprehensive look at two stakeholder groups (teachers and administrators). A series of ANOVA tests Tukey' HSD post-hoc analyses were presented to show specific differences between groups. The findings can be used to inform policy makers and program providers, as well as inform professional practice.

Chapter Five

Survey and Interview Findings

Summary

The overarching research question for the study was "What are the perceptions of teachers and administrators from the five largest Nebraska public schools that have one-to-one computer initiatives for four or more years." Quantitative data were collected in Phase I using a web-based survey of study participant's perceptions about a one-to-one laptop initiative in general. A collection of qualitative data occurred with interviews of administrators and teachers from the five largest schools with a one-to-one computer initiative. The researcher selected an explanatory mixed-methods model to more deeply explore and explain the findings from the study.

This study on perceptions of teachers and administrators from the five largest districts with one-to-one laptop initiatives was conducted in conjunction with a parallel study of teachers and administrators' perceptions of the five smallest schools completed by Damon McDonald. A comparison between the two groups of educators is provided in the final chapter to expand the breadth of the study.

Subjects for this study were recorded from the Department of Education, Financial Services website. The subjects were chosen from the formula based for student enrollment for the 5 largest schools that had one-to-one computer initiatives for 4 or more years. If a school chose not to participate in the study, the next school in student enrollment was asked to be surveyed. Superintendent's from the largest school districts recommended administrators and teachers from the 5 school districts. Approximately

48.6% of the 107 combined administrators and teachers were sent the survey. Of a potential 107 teachers and administrators, 52 submitted the survey.

Discussion

The findings of this study were organized around the administrators and teachers perceptions of a one-to-one computer initiative. The explanatory mixed-methods model selected for the study was sequential in nature as perceptions were analyzed in the Phase I quantitative portion of the study and then explained in the follow up qualitative phase. As the interview protocol was intentionally aligned with the Phase I survey, the primary themes identified through the qualitative analysis aligned accordingly. In Phase II the five themes were (a) perceptions of teachers/admin of the implementation, (b) perceptions of student engagement, (c) perceptions of student grades, (d) benefits of one-to-one technology, and (e) perceptions of continued success of one-to-one initiatives.

Discussion of Findings

Quantitative findings. The quantitative research had a total of 35 questions with 10 questions having a significant difference in perceptions between teachers and administrators. Questions that had no significant difference were questions 2-4, 6, 7, 9, 17, 19-36. The questions that will be discussed in Chapter Five will be those that had a significant difference.

The first research question that had a significant difference was the question related to which students were engaged after the laptop initiative.

Discussion of findings for research question 5. Research question 5: Please rate the degree to which students were engaged after the laptop initiative.

Administrators' responses to the survey questions were significantly different than that of the teachers. The administrators mean quality rating was 3.7778 compared to the teachers mean score of 3.4651. Administrators believed students were more engaged after the laptop initiative than teachers. The perception of the administration on student engagement could be a result of less interaction with the students as they use the school issued laptops. Teachers have more interaction and could observe student engagement after the laptops were introduced. Since the teachers have observed the students using the laptops at a higher rate than the administrators they may have a more realistic perception of the engagement than the administration. The teachers' perception may be less than the administrators due to the daily interaction with the students and laptop usage.

Discussion of findings for research question 8, 10-14, 15, 16, 18. The survey questions 8, 10, 12, 13, 14, 15 were in the survey as a grid style format. The questions for this section have been sorted by the administration significant difference of mean scores and the teachers' significant difference in the mean scores for each response. For the first set of questions, (8, 10, 12, 13, 14, 15) the administration had the higher mean quality rating. For the second set of questions (11, 16, 18) the teachers had a higher mean quality rating.

Research question 8. How often do you incorporate the use of laptops with discussion activities in your classroom? The administrators mean quality rating was 4.8889 compared to the teachers mean score of 3.2857.

Research question 10. How often do you incorporate the use of laptops with drill practice assignments in your classroom? The administrators mean quality rating was 5.5714 compared to the teachers mean score of 4.5349.

Research question 12. How often do you incorporate the use of laptops with in-class reading in your classroom? The administrators mean quality rating was 5.5556 compared to the teachers mean score of 4.3721.

Research question 13. How often do you incorporate the use of laptops with in-class writing in your classroom? The administrators mean quality rating was 5.7143 compared to the teachers mean score of 5.5476.

Research question 14. How often do you incorporate the use of laptops with project involving problem solving in your classroom? The administrators mean quality rating was 5.7778 compared to the teachers mean score of 4.75.

Research question 15. How often do you incorporate the use of laptops with projects involving analysis of data in your classroom? The administrators mean quality rating of 6.0000 compared the teachers mean rating of 4.9268.

The administrators' perceptions to the survey questions were significantly different than that of the teachers. They believed that the teachers utilized laptops in the classroom for discussion, drill and practice assignment, in-class reading, in-class writing, projects involving problem solving, and projects involving analysis of data. The teachers did not believe these practices were used as much as administration. The difference in perception maybe due to the teachers' daily observations and utilizing the laptop during the school day compared to the administrators more removed observations and communication with the teachers and students on how the laptops were used in the

classroom. The administrators' perception is based on the formal and informal observations and communication with the staff and students. The administration are more removed from the day-to-day operation in the classroom and rely on the observations and interactions with teachers and staff to create their opinions about how teachers use the laptops in class.

Discussion of findings for Research Question 11 and 16.

Research question #11. How often do you incorporate the use of laptops with in-class research in your classroom? The teachers mean quality rating was 6.1395 compared to the administrators mean score of 6.0000.

Research question #16. How often do you incorporate the use of laptops with ability to create an original product in your classroom? The teachers had a mean quality rating of 5.5814 compared to the administrators had a mean quality rating of 5.8750

The teachers' perceptions to the survey questions were significantly different than that of the administration. The teachers believed that they utilized laptops in the classroom for in-class research and the ability to create an original product. The administration did not believe these practices were used as much as the teachers did. A teacher may have a better perception of what they are doing with the laptops in the classroom than the administration. Teachers are more hands on with creating lesson plans, utilizing the laptop as a learning tool and working with students. The teacher's perceptions also are developed from reviewing and grading tests and homework assignments. This would be another area the teachers may base their perceptions on in regards to in-class research and creating an original product.

Discussion of findings for Research Question 18. How prepared are your students in the using technology for expressing themselves artistically? The teachers had a mean quality rating of 4.2727 compared to the administrators mean rating of 3.8750.

The teachers had a significantly higher mean rating than the administrators in the perception to incorporate the use of laptops for expressing themselves artistically in the classroom. Teachers' perceptions may be derived from their hands-on applications with students. A teacher can monitor the student's performance in using technology for expressing themselves artistically through reviewing student work and grading assignments. Administrators do not have the opportunity like teachers do to observe these perspectives.

Qualitative findings. Themes were identified from interviews with 20 teachers and 9 administrators. The 5 themes were: (a) perceptions of teachers/admin of the technology implementation, (b) perceptions of student engagement, (c) perceptions of student grades, (d) benefits of one-to-one technology, and (e) perceptions of continued success of one-to-one initiatives.

Perceptions of teachers and administrators regarding the technology implementation. In comparing the results of the teachers and administrators for the first theme the administrators appeared to be more focused on the success of the students. They perceived that the implementation of the one-to-one laptop initiative leveled the playing field for all students. One administrator stated, "Without the initiative, it is impossible to give every student the same tools to utilize during their high school career." The administrators also believed that technology was very important to the district, it allows students and teachers to utilize the laptops as tool for learning everyday all day.

Teachers had mixed responses about the one-to-one initiative. The majority of teachers perceived the laptop initiative had a focus on student learning but some teachers wished the district would have involved them more in the decision-making during the implementation process. Teachers perceived the school district used the proper procedures for implementing the laptops. One teacher talked about her school districts' implementation process, "At our school we were involved in the decision making and also included in the committees that toured other schools. We had a say in the process and the introduction of the laptops to the students went really smooth". Others thought the initiative was administration driven without the teacher input. One teacher stated, "It was superintendent driven through writing grants to help fund the laptops and pushing for the program to be implemented." The lack of teacher input can change the implementation of a one-to-one initiative. The success of a program is higher when all involved have a say. The implementation of a one-to-one computer initiative is very important on how a school uses their staff to make decisions. To have a successful initiative administration, teachers and students need to be involved in the process.

Perceptions of student engagement. All administration interviewed said they thought the one-to-one laptop initiative increased student engagement. The comments were very strong for the increased focus of the students using the laptops as a tool for learning. An administrator stated, "Students obviously are more interested in a subject when it is connected with technology and student engagement increases when they become interested in a subject, thus much stronger learning will take place." The increased focus on the laptops created engagement for the students. Administrators focused on the laptop as a tool for learning thus creating the engagement piece for

students. Administrators that have implemented one-to-one computer initiatives in their buildings noticed increased student motivation, engagement, and interest.

Teachers had many different thoughts about student engagement due to the one-to-one laptop initiative. One teacher perceived that the laptops were a great tool to use but student engagement begins with an active lesson that is designed by the teacher. The laptop can help the lesson be more engaging but that is a small part of the lesson. Students can use the computers to engage other students or staff day or night. The laptop computer is a tool if utilized right that will benefit students and staff. Some other teachers used the laptop as an incentive. If the students didn't keep up their grades they could not use the laptop.

The ability to engage students with the laptop was up to the teacher to create assignments and lessons that strike the interest of the students. Engagement starts with sparking the interest of the student and continues with enriching the curriculum.

Perceptions of student grades. Administrators perceived the impact of the one-to-one initiative had little effect on student grades. One Superintendent said, "I'm not as concerned as the effect of what laptops have on grades as I am with different levels of thinking students can have and apply in their learning through the use of technology. If that equates into an increased grade, excellent."

All of the administrators that were interviewed believed the one-to-one laptop initiative didn't have a direct affect on student grades but did have an effect on student participation and engagement. The laptops were used as a tool to promote learning and enhance the subject while creating a positive learning environment for the student. The

administrator indicated that the laptop initiative did create student interest and engagement which had an indirect effect on student grades.

The majority of teachers also had the same thoughts that the administrators' did. The teachers believed the laptops were great tools for learning and kept the students engaged and focused on the subject. One teacher however, perceived that the laptop takes away from her teaching penmanship; handwriting has become a lost art. Another teacher likes the laptops for writing and research but in some cases the teacher would like to know what the students are thinking, not what they can find on the internet. Teachers do believe that the laptops are great tools to use but they do not directly impact the student's grade.

Benefits of one-to-one technology. The administrators believed there were many benefits to the one-to-one laptop initiative. Students with different socio economic backgrounds had the same opportunity when they were a issued a school laptop. As many administrators said, it levels the playing field for all students. Administrators also believed schools were giving students more resources through the use of the laptops and it also creates an opportunity to develop technology skills for the future. Teaching with technology also was more efficient when used as a tool, the classrooms have become more student centered.

Teachers have many different views on the benefits of the one-to-one laptop initiative in schools. There was a wide range of teacher views about the laptops including benefits students only if they take the initiative to utilize the technology. A teacher said, "Students have immediate contact with the instructor 24/7; they have access to classroom materials at their fingertips. They also are becoming more prepared for a technological

world." As for the teachers, times have changed, teachers need to enhance their instruction with technology to utilize the laptops as tools for students.

Another teacher stated, "I really like to tell the students they have no excuse. The students can be more organized; they can set up a calendar, email teachers, and communicate with other students. It helps them manage their time more efficiently." The laptop is a tool that if used appropriately should help students and staff become more effective learners and teachers.

Technology is already a big part of our lives. The student's utilization of the technology can be improved through teachers immersing students with new ways of learning. Schools are creating opportunities for students to utilize the technology for the future.

Perceptions of continued success of one-to-one initiatives. Administrators and teachers both agree the success of the one-to-one initiative relies on financial support, commitment from all stakeholders, proper implementation process and continued support and training for teachers and students. Schools need to commit to strategic planning strategies to update their technology infrastructure to maintain a positive technology culture within their districts. An administrator said "It is important to think ahead and have a plan to keep the laptops updated due to the cost of the laptops."

The teachers believed to have continued success with their districts laptop initiative they would appreciate continued professional development opportunities. They also recognized the need to support and update the current network infrastructure to meet the demands of technology in school systems. A teacher said, "I have talked to the

Superintendent about continuing the program and he believes the district needs to budget every year for updates to the servers and increased bandwidth."

Recommendations

To address the overarching question of this study, "What are the perceptions of teachers and administrators that have one-to-one computer initiatives for four or more years?" The research questions from this study focused upon the perceptions of the teacher and administrator in regards to implementation, engagement, grades, benefits, and continued success. It was important to the school district personnel to question and find out just how much the laptops were being used when considering the financial investment made by the technology initiative. The next logical step in the research process would be to consider specific uses and purposes within the reported use. The goal of the laptop initiative should be to deliver engaging content while utilizing higher-level comprehension and reasoning skills.

Recommendation one. Further study of natural extensions from this study might include activities students complete with the laptops as opposed to total time using laptops (e.g., blogging, emailing, video production, etc.). These results could be correlated with specific content areas to inform the school district personnel to what extent students complete these activities for example, science classrooms utilize interactive websites within instruction. Additionally, because both groups were asked the same questions, similarities and/or differences in perception could be uncovered to better inform the future effectiveness of the program.

Recommendation two. Some interesting correlations could be drawn while introducing other variables such as readiness for state testing, types of activities involved

in class, use of laptop outside the home, etc. These questions could be analyzed to see if the one-to-one laptop initiative made any significant difference in achievement preparedness. If the school district peesonnel was interested in obtaining qualitative data, open-ended questions could be asked of individual stakeholders. These collective responses could then be categorized and sorted using a content analysis to find any commonalities or trends. For instance, if groups were asked how they perceived the progression of the laptop initiative or had any feedback on what improvements should be made, this information could help guide and inform the continued success of the district's current technology initiative.

Recommendation three. Further studies could be conducted on the developments of the long-term effects upon the one-to-one laptop initiative on students after they graduate from high school. Research on students who graduate from a one-to-one school district and are entering a post secondary learning institution could be gathered to determine if students were better equipped for the new learning environment because of the experience they had in high schools with one-to-one technology initiatives.

Recommendation four. A further study of the one-to-one initiative with other technology devices that school districts are utilizing need to be studied. School district personnel have started to utilize new technology with iPads, Chromebooks, and Smartphones for one-to-one technology initiatives. The financial implications for school districts with the new technology might be far less than the current laptop initiative. School districts can also utilize many different programs, applications and cloud storage through Internet programs such as Google for free. Should school district personnel look

at a multi device technology initiative to meet the demands of society once students leave for post secondary institutions or enter into the workforce.

Chapter Six

Nebraska Administrators and Teachers Perceptions of One-to-one Computer Initiatives in High Schools

Purpose

The purpose of the 2 parallel explanatory mixed methods studies conducted by Damon McDonald and Brian Maschmann was to explore and compare the perceptions of administrators and teachers from the 5 largest and the 5 smallest high schools that have had the one-to-one computer initiative for 4 or more years. The structure of the parallel studies was identical with the only difference being the sample considered. Results, discussion, and recommendations within the "administrator" study dealt exclusively with responses and comments from superintendents, principals, and other administrators. Conversely, only responses and comments from teachers were discussed in the "teacher" study. Teachers of English, mathematics, science, and social studies were included within the sample. The results from the 17 administrators and 64 teachers will be compared within this chapter.

Research Design and Methodology

The researchers selected an explanatory mixed methods approach for this study. Quantitative data were collected in the initial phase (Phase I) of the study using a survey of administrators' and teachers' perceptions from the five largest and five smallest school districts with one-to-one computer initiatives. The collection of quantitative data was followed with the collection of qualitative data in the second phase (Phase II) of the study for the purpose of assisting in the explanation and interpretation of the findings. The collecting of data was initially piloted with subjects chosen from the Nebraska

Department of Education's Financial Services website. Subjects were chosen from their formula used to determine student enrollment for the five largest and five smallest Nebraska public high schools that have completed one-to-one computer initiatives for four or more years.

Teachers and administrators from both the five largest and five smallest Nebraska public schools were surveyed using a survey developed by the researchers from a review of the literature and organized around the two research questions and hypotheses.

Research Question 1: What are the perceptions of administrators and teachers about the number of hours per week students use laptops for school assignments across content areas (language arts, social studies, science, and math)?

Hypothesis 1: There will be no significant differences among administrators and teachers.

Research Question 2: What are the perceptions of administrators and teachers concerning the impact of laptops on academic success across content areas (language arts, social studies, science, and mathematics)?

Hypothesis 2: There will be no significant differences among administrators and teacher's perceptions concerning the laptops effects on academic success across content areas (language arts, social studies, science, and mathematics).

Participants

The survey population for the parallel studies consisted of administrators and teachers in 10 public school districts that have one-to-one computer initiatives for 4 or

more years. Contact information for 140 educators was submitted by 20 school districts. The potential respondents, including 18 administrators and 122 teachers, received an email containing an individualized link to the survey for the quantitative data (57.86% of potential participants) (see Table 18).

Table 18

Response Rate

Source	Sample	Respondents	%
Administrators	18	17	94.44
Teachers	122	64	52.45
Total	140	81	57.86

The focus of this combined comparison was between teachers and administrators from the five largest Nebraska school districts and the five smallest school districts. The total number of teachers was analyzed by curriculum responsibility and the number of administrators was analyzed by position (see Table 19).

Findings: Phase I Quantitative Data

The findings of the combined Phase I quantitative study are organized by the significant difference in the five largest and five smallest public high schools that have a one-to-one laptop initiative. The significant difference between the groups will be discussed in three different data sets: non-rural school vs. rural school administrators, non-rural school vs. rural school teachers, and a combined non-rural school teacher and administrator vs. a combined rural school teacher and administrator.

Table 19

Sample for Parallel Studies

Source	Respondents	%
Administrators	17	
Superintendent	9	52.94
Principal	8	47.06
Teachers	63	
Reading/Language Arts	21	33.33
Mathematics	17	26.98
Science	15	23.81
Social Studies	10	15.87

Significant differences among teacher compared to administrators. Only the questions that only had a significant difference will be discussed.

Question One: On average, how many hours per week (during school hours) do you believe students use the school issued laptop computers? A significant difference existed between teachers and administrators perceptions of how many hours per week (during school hours) students used school issued laptop computers. The teachers from the smallest school district had a mean quality rating of 2.100 (SD = 1.02084), and the teachers from the largest school district had a mean rating of 1.930 (SD = .88359). The teachers from both small and large school districts with a one-to-one laptop initiative were (.000) significant in their beliefs about how many hours per week students used laptop computers. The administrators did not have similar beliefs about this question ($p < .05$).

Question Two: On average, how many hours might students spend using laptops at home to complete assignments? A significant difference existed between teachers' and administrators' perceptions about how many hours students spend using laptops at home to complete assignments. The teachers from the smallest school districts had a mean quality rating of 1.500 (SD = .82717), and the teachers from the largest school districts had a mean rating of 1.674 (SD = .80832). The teachers from both small and large school districts with a one-to-one laptop initiative were significant (.000) in their beliefs about how many hours students spend using laptops at home to complete assignments. The administrators did not have similar beliefs about this question ($p < .05$).

Question Three: Please rate the degree to which you believe school issued laptops may have affected students' last nine weeks' grades in your content area. A significant difference existed between teachers' and administrators' perceptions of the degree to which they believed school issued laptops have affected students' last nine weeks' grades in their content area. The teachers from the smallest school districts had a mean quality rating of 2.2500 (SD = 1.01955), and the teachers from the largest school districts had a mean rating of 2.2558 (SD = .97817). The teachers from both small and large school districts with a one-to-one laptop initiative were significant (.000) in their beliefs about the degree to which they believed school issued laptops might have affected students' last nine weeks' grades in their content area. The administrators did not have similar beliefs about this question ($p < .05$).

Question Four: How often do you believe laptops are used during the lecture activities in your school? A significant difference existed between teachers' and administrators' perceptions of the degree to which they believe laptops are used during the lecture activities in the school. The teachers from the smallest school districts had a mean quality rating of 4.200 (SD = .2.21478), and the teachers from the largest school districts had a mean rating of 3.285 (SD = .1.81169). The teachers from both small and large school districts with a one-to-one laptop initiative were significant (.018) in their beliefs of the degree to which they believe laptops are used during the lecture activities in the school. The administrators did not have similar beliefs about this question ($p < .05$).

Question Five: How often do you believe laptops are used during the discussion activities in your school? A significant difference existed between teachers' and administrators' perceptions of the degree to which they believe laptops are used during the discussion activities in the school. The teachers from the smallest school districts had a mean quality rating of 3.4000 (SD = 1.75919), and the teachers from the largest school districts had a mean rating of 3.2143 (SD = .2.10152). The teachers from both small and large school districts with a one-to-one laptop initiative were significant (.027) in their beliefs about the degree to which they used laptops during the discussion activities in the school. The administrators did not have similar beliefs about this question ($p < .05$).

Question Six: How often do you believe laptops are used during the in class research activities in your school? A significant difference existed between teachers' and administrators' perceptions of the degree to which they believe laptops are used during the in class research activities in the school. The teachers from the smallest school districts had a mean quality rating of 3.800 (SD = 2.26181), and the teachers from the

largest school districts had a mean rating of 4.372 (SD = 2.25751). The teachers from both small and large school districts with a one-to-one laptop initiative were significant (.008) in their beliefs about the degree to which they used laptops during the in class research activities in the school. The administrators did not have similar beliefs about this question ($p < .05$).

Question Seven: How often do you believe laptops are used during the project involving problem-solving activities in your school? A significant difference existed between teachers and administrator's perceptions of the degree to which they believe laptops are used during the project involving problem-solving activities in the school. The teachers from the smallest school districts had a mean quality rating of 4.600 (SD = 2.01050), and the teachers from the largest school districts had a mean rating of 4.927 (SD = 1.91560). The teachers from both small and large school districts with a one-to-one laptop initiative were significant (.015) in their beliefs about the degree to which they used laptops during the projects involving problem-solving activities in the school. The administrators did not have similar beliefs about this question ($p < .05$).

Significant differences among administrators compared to teachers.

Question Eight: How prepared are your students using technology for communication? A significant difference existed between teachers and administrator's perceptions of the degree to which they believe **s**tudents are prepared using technology for communication. The teachers from the smallest school districts had a mean quality rating of 4.4500 (SD = .60481), and the teachers from the largest school districts had a mean rating of 4.2727 (SD = .62614) The teachers from both small and large school districts with a one-to-one laptop initiative were significant (.026) in their beliefs about

the degree to which they believe **s**tudents are prepared using technology for communication. The administrators did not have similar beliefs about this question ($p < .05$).

Significant differences between teachers and administrators in the smallest school district compared to the teachers and administrators in the largest school districts with one-to-one laptops.

Question Nine: How prepared are your students using technology for expressing themselves? A significant difference existed between the smallest school districts participants and largest school districts participants with the perception of how prepared students are using technology for expressing themselves. The teachers and administrators from the smallest school districts had a mean quality rating of 3.9074 (SD = .65209), and the teachers and administrators from the largest school districts had a mean rating of 4.0588 (SD = .96635). The teachers and administrators from both small and large school districts with a one-to-one laptop initiative were significant (.036) in their beliefs on how prepared their students are using technology for expressing themselves. The administrators did not have similar beliefs about this question ($p < .05$).

Question Ten: On average, how many hours per week do you spend with school-issued laptops social networking? A significant difference existed between the smallest school districts participants and the largest school districts participants with the perception of on average, how many hours per week do you spend with school-issued laptops doing social networking. The teachers and administrators from the smallest school districts had a mean quality rating of 4.4500 (SD = .60481), and the teachers and administrators from the largest school districts had a mean rating of 4.2727 (SD =

.62614). The teachers and administrators from both small and large school districts with a one-to-one laptop initiative were significant (.026) in their beliefs about how many hours per week they spent with school-issued laptops doing social networking. The administrators did not have similar beliefs about this question ($p < .05$).

Question Eleven: On average, how many hours per week do you spend with school-issued laptops podcasting and video casting? A significant difference existed between the smallest school districts participants and the largest school districts participants with the perception of on average, how many hours per week do you spend with school-issued laptops podcasting and video casting. The teachers and administrators from the smallest school districts had a mean quality rating of 3.2581 (SD = 1.35423), and the teachers and administrators from the largest school districts had a mean rating of 2.8824 (SD = 1.21873). The teachers and administrators from both small and large school districts with a one-to-one laptop initiative were significant (.036) in their beliefs about how many hours per week do you spend with school-issued laptops podcasting and video casting. The administrators did not have similar beliefs about this question ($p < .05$).

Findings: Phase II Qualitative Data

The findings of the qualitative data gathered in Phase II of this study were considered as combinations of administrator and teacher responses. The interview questions were explored through the qualitative data gathered through open-ended questions as part of the Phase I survey and through personal interviews by the researchers with teachers and administrators in Phase II. The strategy of aligning the Phase II interview protocol with the Phase I survey paralleled the explanatory mixed-methods design selected for the study. After review and reflection, five areas were determined to

be the major themes for the qualitative portion of the study: (a) perceptions of teachers/administrator of the implementation, (b) perceptions of student engagement, (c) perceptions of student grades, (d) benefits of one-to-one technology, and (e) perceptions of continued success of the one-to-one initiatives. Further coding of the responses provided insight into general categories within each of the five themes of the study (see Table 20).

Teachers and administrators from the five smallest and five largest schools with a one-to-one laptop initiative overwhelmingly indicated that the implementation process was a major aspect of the comfort level with staff. The reaction of the implementation process was different between each group. The administrators' focus was student driven as they perceived that the implementation of the one-to-one laptop initiative leveled the playing field for all students. The teacher's focus was centered on the implementation process of the one-to-one initiative. The teachers who had a part in their district's decision-making process had a more positive experience with a shift in their abilities to enhance their lesson plans. Other teachers believed the administration did not allow the teachers to be a part of the implementation process and the one-to-one initiative was not as successful.

When considering the second theme, administrators from the smallest and largest schools thought that the one on one initiatives increased student engagement. This belief is summarized by an administrator's comment, "The technology is the tool that helps to engage students. They know there is kinesthetic research to support active participation with technology. If students are engaged in the classroom their achievement will be

higher.” Teachers had mixed reviews from both the smallest school and the largest schools. One teacher said,

Table 20

Themes and Codes of Administrators and Teachers Themes from the Interviews

1.	Perceptions of teachers/administrator of the implementation	
	a. Instructional purpose	36
	b. Level playing field	21
	c. Give opportunities to students	25
	d. Use technology outside the classroom	26
	e. Technology integration	16
2.	Perceptions of student engagement	
	a. Student learning	29
	b. Access to the internet	24
	c. Student motivation	25
	d. Improved communication	23
	e. Connect with the students	13
3.	Perceptions of student grades	
	a. Use as a tool	41
	b. More engaged for learning	27
	c. Aware of assignments	26
	d. A resource	17
4.	Benefits of one-to-one technology	
	a. Student engage	41
	b. Digital citizenship	27
	c. Faster paced	22
	d. Enrichment of curriculum	14
	e. Supplementary instruction	16
5.	Perceptions of continued success of one-to-one initiatives	
	a. Worth implementing	44
	b. Best for students	13
	c. Financial implications	12

> Engagement begins and ends with the lessons and activities designed by the teacher. Computers, if used well, can make said lessons more engaging, but that all depends on the lesson or activity. Simply adding a computer doesn't guarantee higher levels of engagement.

Another teacher perceived the laptops needed to play a role in the classrooms day-to-day activities in the school, but still allow the content to lead the learning process.

When considering the third theme, there was a consistent dialogue regarding the perceptions on student grades by the majority of teachers and administrators from the smallest and largest school districts. Teachers and administrators both believed that the one-to-one laptop initiative was not solely responsible for increases in student academic grades, but it did have an effect on engagement and increased student interest. Most of the comments from the administrators indicated the actual laptop seemed to be used more as a tool for learning and not necessarily a means for improving student grades. One administrator stated, "Students have said they are more enthused about being in a classroom with laptop technology." The laptop initiative did create more student interest and engagement in the classroom lessons, which had an indirect effect on student grades.

The majority of teachers did indicate the heightened creativity of students through the use of laptops had been positive for their districts. Some teachers believed the student's engagement in their lessons had increased, but definitively couldn't stipulate that the laptops were the sole reason some students' grades increased. Laptops are a tool like anything else, like a textbook or a pencil. Students who realize the benefits of the technology and how it enhances their work will have a greater chance of receiving higher academic grades.

Theme four focused on the benefits of the one-to-one initiative. There was a common theme among the administrators. The administrators believed the one-to-one

initiative was a benefit to the students from all socioeconomic backgrounds. As many administrators stated, “it levels the playing field for all students.” Administrators believe all students benefit by having a laptop as it creates multiple opportunities for success using the technology.

Teachers from non-rural and rural groups shared many different views on the benefits of the one-to-one laptop initiative in their districts. Some appreciated the combination of the laptops with the Internet. The Internet provides an efficient way for the students to immerse themselves with information with the click of a keypad. The student’s utilization of the laptops really depended on whether their teachers had expectations of enhancing their content areas using the laptops. The teachers indicated their schools are creating opportunities for the students to utilize the technology for future growth. The majority of the teachers indicated the benefits of the one-to-one laptop initiative centered on the increased engagement of the students in their classrooms as observed by them.

The fifth theme focused on the continued success of the one-to-one initiative. Administrators agreed the success of the one-to-one initiative relies on financial support, commitment from all stakeholders, proper implementation process and continued support and training for teachers and students. The laptops are very expensive learning devices that offer enhanced resources for student centered learning. Schools will need to continue to commit to strategic planning strategies to update their technology infrastructure to maintain a positive technology culture within their districts.

Teachers believed they needed support through continued opportunities in professional development focused on the laptop and using the laptop to enhance their

classroom lessons. One teacher stated, "We need to stay current with our professional development opportunities as the technology continues to develop and advance." Staff development through exploration and proper implementation of any technology device or infrastructure will give more opportunities to the students to be successful in a one-to-one laptop environment.

Recommendations

The data collected by this study has potential value to guide other school personnel in understanding the dynamics of implementation of a one-to-one laptop or technology initiative. Teachers and administrators are positive about the added value of a technology initiative to their school system. A successful implementation process fosters more commitment from teachers to use the device in the classrooms, which increases student engagement and the potential for more student centered lesson plans. However, these same educators did not come to a consensus regarding whether the one-to-one laptop initiative improved student grades.

The following recommendations address the overarching question of this study, "What are the perceptions of teachers and administrators of a one-to-one laptop initiative.

Recommendation one. This study has established a baseline for future research relating to one-to-one technology initiatives in the high school settings. Continuing study of student engagement with the use of the technology and teacher insight on curriculum and improved instruction implications of increasing student learning, can guide potential modifications within the implementation of a one-to-one technology initiative for school systems.

Recommendation two. Researching other types of devices and the how they are used when implementing a one-to-one environment. School district are starting to utilize iPads and chromebooks as one-to-one devices. The devices are supported by universal data storage such as Google cloud. The devices are much more cost effective than the laptops and can have many different alternative uses in the classroom.

Recommendation three. Understanding the implementation of a one-to-one initiative is important to the success of the program. Key stakeholders are a vital role in the entire process of developing a plan for the technology initiative. Everyone from the parents, school board, administration, teachers and students are accountable for the success of the initiative.

Future Research

School districts took a leap of faith when they invested time, energy and money in technology initiatives without much data to support the positive outcomes or challenges it possesses for our educational systems. Additional research to identify non-rural and rural school districts' implementation process of technology initiatives is needed to identify additional one-to-one technology initiatives that were used besides laptops. Currently Nebraska has many schools that have one-to-one technology devices other than laptops. These devices are relatively new to the technology world. School districts have just started using them to replace their current one-to-one laptops. There are advantages and disadvantages to the new devices. Future research could aid in the development of a model for best practices for schools to implement a multi-tiered technology approach to student centered learning.

Students will continue to become more dependent on the use of technology as it relates to their lives and future careers. Technology will change and affect educational learning environments in the future. Administrators and teachers will need to continue to discuss and implement the best pedagogy for student success with the current emphasis on technology.

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Appendix A

Phase I: Informed Consent for Survey

Informed Consent Form for Phase I Survey

Identification of Project: One-to-one Laptop Initiative: Perceptions Between Teachers and Administrators

Purpose of the Research: The purpose of this study is to examine the perceptions of Nebraska teachers and administrators participating in a one-to-one laptop environment designed to improve teaching and student learning.

Participants: Educators who are selected to receive this survey were chosen from the five smallest and five largest schools with a one-to-one computer initiative for four or more years. If a school elects not to participate in the study, the next school in student enrollment size will be asked to be surveyed.

Procedures: The completion of this survey will take approximately 10 minutes of your time. The survey consists of 14 questions related to your perception on one-to-one laptop initiative at your school. You will also be given the opportunity to consent to a follow up interview.

Risks and/or Discomforts: There are no known risks or discomforts associated with this research. In the event of a problems resulting from participation in this study, psychological treatment is available on a sliding fee from University of Nebraska-Lincoln Psychological Consultant Center.

Benefits: If interested you will receive a copy of this study's findings. You may find results in this study to validate your perceptions about one-to-one laptop initiatives. You will have the opportunity to see how other educators in the five smallest and five largest schools with a one-to-one computer initiative for four or more years value the one-to-one laptop initiatives.

Confidentiality: Any information obtained during this study, which could identify you, will be kept strictly confidential. All personal identifiable information will be removed from the study narratives and aliases will be used to protect your privacy.

Compensation: There will be no compensation in this study

Opportunity to Ask Questions: You may be asked any questions concerning this research and have those questions answered before or agreeing to participate in the study. You may also call one or both of the principal investigators at numbers identified on the following page, Please contact the investigators:

- if you want to voice concerns or complaints about this research or
- in the event of a research related injury, or
- if you would like to receive a copy of the results of this study.

If you would like to speak to someone other than the researchers of this study, please contact the Research Compliant Service Office at (402) 472-6995.

Freedom to Withdraw: Participation in this study is voluntary. You may refuse to participate or withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln or your school district or in any other way receive a penalty or loss in benefits in which you are entitled.

Consent: You are volunteering making a decision in whether or not to participate in this research study. You will be given the opportunity to continue with this survey, thus giving the consent to participate, or to exit the survey and not participate.

Names and Phone Numbers of Investigators:
Damon McDonald
Brian Maschmann
Jody Isernhagen

Appendix B

Phase I: Superintendent Introductory Letter

Dear Superintendent,

We are contacting you to ask for your help in preparation for a joint research study that we will be conducting as part of the requirements for completion of doctoral program at the University of Nebraska-Lincoln. The purpose of this study is to examine the perceptions of Nebraska teachers and administrators participating in a one-to-one laptop environment designed to improve teaching and student learning. As superintendents of two Nebraska schools, we believe that the study is timely and has the opportunity to provide valuable information to Nebraska educational leaders.

An electronic message will follow to provide additional explanation of the study, describe eligibility of educators in your district and include the request for contact information. We will be asking you, or your designee, to provide an email contact information for educators in your district that have participated in a one-to-one laptop initiative.

Eligible educators will be contacted and asked to participate in the research study during the spring term, 2014. Participants will be asked to complete an online survey intended to gather information about participating in a one-to-one laptop initiative.

Educator participating in this survey is voluntary and participants may withdraw at any time without consequences. Answers on the survey will be kept confidential. data will be secure and any report of this research that is made available to the public, will not include participants names or any other individual information.

If you have any questions, please contact either of us at the email address listed below or you may contact our advisor, Dr. Jody Isernhagen at (402) 472-1008. A summary of the results of this study will be sent upon your request and will be available after the study is complete.

Sincerely,

Mr. Damon McDonald (dmcdonald@4rhuskies.org)
Mr. Brian Maschmann (brian.maschmann@nsdtitans.org)
Dr. Jody Isernhagen (jisernhagen3@unl.edu)

Appendix C

Phase I: Superintendent Follow-up Email

Dear Superintendent,

We are contacting you to ask for your help in preparation for a joint research study that we will be conducting as part of the requirements for completion of doctoral program at the University of Nebraska-Lincoln. The purpose of this study is to examine the perceptions of Nebraska teachers and administrators participating in a one-to-one laptop environment designed to improve teaching and student learning. As superintendents of two Nebraska schools, we believe that the study is timely and has the opportunity to provide valuable information to Nebraska educational leaders.

We will be asking you, or your designee, to provide an email contact information for educators in your district that have participated in a one-to-one laptop initiative. Educator participation in the survey is voluntary and participants may withdraw at any time without consequences.

Nebraska administrators involved in the one-to-one laptop initiative study are defined as superintendents and principals for the purpose of this study. Nebraska teachers involved in the one-to-one laptop initiative are defined as teachers in a one-to-one laptop initiative school. You are encouraged to include all eligible educators and also include any educators whom you are unsure of their eligibility for the study. The researchers will make the final determination of eligibility utilized data collected in the demographic portion of the survey

The information may be submitted in a spreadsheet, a word-processing document, or within the body of an email message. Please submit the contact information in the following format:

Name	Position	Email Address.
John Smith	Superintendent	J.Smith@esu00.org
Minnie Mouse	Teacher	m,mouse@hotmail.org

Thank you for your consideration of our request for contact information. A summary of the results of this study will be sent upon your request and will be available after the study is complete.

Sincerely,

Mr. Damon McDonald (dmcdonald@4rhuskies.org)
Mr. Brian Maschmann (brian.maschmann@nsdtitans.org)
Dr. Jody Isernhagen (jisernhagen3@unl.edu)

Appendix D

Phase I: Superintendent 2nd follow-up Email

Dear Superintendent.

This electronic message serves as a second follow-up to the introductory letter sent to you previously (attached for your convenience). As superintendents of two Nebraska schools, we believe that the study is timely and has the opportunity to provide valuable information to Nebraska educational leaders.

We will be asking you, or your designee, to provide an email contact information for educators in your district that have participated in a one-to-one laptop initiative. Educator participation in the survey is voluntary and participants may withdraw at any time without consequences.

Nebraska administrators involved in the one-to-one laptop initiative study are defined as superintendents and principals for the purpose of this study. Nebraska teachers involved in the one-to-one laptop initiative are defined as teachers in a one-to-one laptop initiative school. You are encouraged to include all eligible educators and also include any educators whom you are unsure of their eligibility for the study. The researchers will make the final determination of eligibility utilized data collected in the demographic portion of the survey

The information may be submitted in a spreadsheet, a word-processing document, or within the body of an email message. Please submit the contact information in the following format:

Name	Position	Email Address.
John Smith	Superintendent	J.smith@esu00.org
Jane Doe	Teacher	J.doe@hotmail.org

Thank you for your consideration of our request for contact information. A summary of the results of this study will be sent upon your request and will be available after the study is complete.

Sincerely,

Mr. Damon McDonald (dmcdonald@4rhuskies.org)
Mr. Brian Maschmann (brian.maschmann@nsdtitans.org)
Dr. Jody Isernhagen (jisernhagen3@unl.edu)

Appendix E

Phase I: Invitation to Participate

Dear Educator,

You are invited to participate in a research study regarding one-to-one laptop initiatives in schools. The purpose of this study is to examine the perceptions of Nebraska teachers and administrators participating in a one-to-one laptop environment designed to improve teaching and student learning. The results generated from this study are intended to contribute to the knowledge base regarding one-to-one laptop environments, and to aid decision makers as they consider adopting one-to-one laptop initiatives for their schools. The study is timely and has the opportunity to provide valuable information to Nebraska educational leaders.

The information for this study will be collected through an online survey done under the direction of our advisor, Dr. Jody Isernhagen. Your identity will be kept confidential in this project. While the survey will be tracked, a list of names and identification numbers will be kept secured with the researchers and will be destroyed upon completion of the project. Results of the study will be published in a doctoral dissertation, but no participants will be identified.

There is also the opportunity for participation in follow up interviews, These follow-up interviews will be recorded and transcribed for use only by the researchers as part of this project.

Participation is voluntary. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with UNL or with us are the researchers.

An email will be distributed notifying participants of the completion of the project. You will be provided contact information for the researchers at the time should you want to receive a summary of the findings of the study.

Please go to the following link to complete the survey:

(Add link to message)

Thank you for your assistance.
Mr. Damon McDonald (dmcdonald@4rhuskies.org)
Mr. Brian Maschmann (brian.maschmann@nsdtitans.org)
Dr. Jody Isernhagen (jisernhagen3@unl.edu)

Appendix F

Phase I: Educator 1st Follow-up

Dear Educator,

This electronic message serves as the follow-up to the introductory message sent to you previously (attached for your convenience.) Please refer to the initial message for more in depth explanation of the purpose of the study and data collection process being utilized.

We are contacting you to ask for your help in preparation for a joint research study that we will be conducting as part of the requirements for completion of our doctoral program at the University of Nebraska-Lincoln. The purpose of this study is to examine the perceptions of Nebraska teachers and administrators participating in a one-to-one laptop environment designed to improve teaching and student learning.

Your responses are valuable to this project because of your experience and perceptions of working in a one-to-one laptop school district. Your participation in the survey is voluntary and you may withdraw at any time without consequences. The survey will take approximately 15 minutes and may be found at the following link. (Insert URL for survey)

Thank you very much for your consideration of our request for participation. A summary of results of this study will be sent upon your request and will be available after the study is complete.

Sincerely,

Mr. Damon McDonald (dmcdonald@4rhuskies.org)
Mr. Brian Maschmann (brian.maschmann@nsdtitans.org)
Dr. Jody Isernhagen (jisernhagen3@unl.edu)

Appendix G

Phase I: Educator 2nd Follow-up

Dear Educator,

This electronic message serves as a second follow-up reminder asking for your participation in an online survey relating to your perceptions of one-to-one laptop initiatives. The previous two messages are attached to this email message for you to refer to

We are contacting you to ask for your help in preparation for a joint research study that we will be conducting as part of the requirements for completion of our doctoral program at the University of Nebraska-Lincoln. The purpose of this study is to examine the perceptions of Nebraska teachers and administrators participating in a one-to-one laptop environment designed to improve teaching and student learning.

We are asking you because of your experience in a one-to-one laptop school district and your perceptions about these experiences are valuable to this project. Your participation in the survey is voluntary and you may withdraw at any time without consequences. The survey will take approximately 15 minutes and may be found at the following link. (insert URL for survey)

Thank you very much for your consideration of our request for participation. A summary of results of this study will be sent upon your request and will be available after the study is complete.

Sincerely,

Mr. Damon McDonald (dmcdonald@4rhuskies.org)
Mr. Brian Maschmann (brian.maschmann@nsdtitans.org)
Dr. Jody Isernhagen (jisernhagen3@unl.edu)

Appendix H

Questions: Teachers

Questions: Teachers

1. How was the laptop initiative implemented?
2. What was the purpose of implementing the one-to-one initiative?
3. How many hours per week during school hours do you involve student use of the school-issued laptop computers?
4. Please share your belief of how school-issued laptops may have affected your students' grades in your content area?
5. How have you used your laptop since one-to-one computing has been implemented in your building?
6. Please share the districts expectations and/or policies regarding student laptop usage?
7. Please share the changes that have occurred as a result of implementation of school-issued laptops.
8. What are some of the benefits for students in a one-to-one computing environment?
9. What would you want to see implemented for continued success of your school-issued laptop initiative?
10. How has the one-to-one computing environment changed how students learn or the way you teach?
11. How has student' engagement in the learning process changed in a one-to-one environment?
12. Was it worth implementing a one-to-one initiative?

Appendix I

Questions: Administrators

Questions: Administrators

1. What was the purpose of implementing a one-to-one initiative?
2. How many hours per week during school hours do you perceive students use the school-issued laptop computers in curricular areas?
3. Please share how school-issued laptops may have affected the students' grades in your district?
4. Please share the types of activities the teachers have incorporated into their classroom with more access to technology.
5. Please share how students use the school-issued laptops throughout the district.
6. What are some of the benefits for students in a one-to-one computing environment?
7. What kind of engagement do you see taking place?
8. Please share the key expectations and/or policies regarding school-issued laptop usage in your district.
9. How has the one-to-one computing environment changed how students learn?
10. How has the one-to-one computing environment changed the way teachers teach?
11. How has the role of school administrators changed in a one-to-one learning environment?
12. How has student' engagement in the learning changed in a one-to-one environment?
13. Was it worth implementing a one-to-one initiative?

Appendix J

Teacher Survey

Dear Teachers:

You are being asked to participate in the following survey because you are a high school teacher and the researchers are interested in teacher and administrator perceptions of laptop for high school students. Your input is very valuable.

Thank you for your time.

Teachers Survey:

Laptop Time and Grading

1. I primarily teach:
   - English/Language Arts
   - Mathematics
   - Science
   - Social Studies

2. On average, how many hours per week (during school hours) do you involve students use of the school issued laptop computers?
   - 0-2 hours per week
   - 2-4 hours per week
   - 4-6 hours per week
   - 6+ hours per week

3. On average, how many hours might students spend using laptops at home to complete assignments from your class.
   - 0-2 hours per week
   - 2-4 hours per week
   - 4-6 hours per week
   - 6+ hours per week

4. Please rate the degree to which students were engaged before the laptop initiative.
   - 1 – not at all engaged
   - 2 – slightly engaged
   - 3 – somewhat engaged
   - 4 – very engaged
   - 5 – extremely engaged

5. Please rate the degree to which students were engaged after the laptop initiative.
   - 1 – not at all engaged
   - 2 – slightly engaged
   - 3 – somewhat engaged
   - 4 – very engaged
   - 5 – extremely engaged

6. Please rate the degree to which you believe school issued laptops may have affected your students' last nine weeks' grades in your content area.
   - No Effect on Grade Average
   - Minor Effect on Grade Average
   - Neutral
   - Moderate Effect on Grade Average
   - Major Effect on Grade Average

7. How often do you incorporate the use of laptops with the following activities in your classroom.

	Never	Almost Never	Occasionally	Almost Every Time	Every Time
Lecture					
Discussion					
Memorization exercise					
Drills and practice assignments					
In-class Research					
In-class Reading					
In-class Writing					
Project involving problem solving					
Projects involving analysis of data					
Ability to create an original product					

8. How often do your students use the school-issued laptops for the following activities:

	Never	Almost Never	Occasionally	Almost Every Time	Every Time
Note-taking					
File storage					
Homework Completion					
In-class assignment completion					
Finding information					

Other (please specify)

9. On average, how many hours per week do you spend with school-issued laptops doing the following activities?

	Never	Almost Never	Occasionally	Almost Every Time	Every Time
Email					
Social Networking					
Instant Messaging					
Chat Rooms					
Blogging					
Mobile Blogging (twitter)					
Gaming Online					
Voice Chat (Skype, etc.)					
Making and sharing movies					
Making and sharing photos					
Creating digital music					
Podcasting videocasting					
Internet Surfing					
Listening to Music					

10. How prepared are your students in the following areas:

	No Option	Not Prepared	Poorly Prepared	Adequately Prepared	Well Prepared
Using technology for communication					
Using technology for expressing themselves artistically					
Using technology for working with others (collaboration)					
Using technology for research					
Using technology for analyzing and problem solving					
Using technology for evaluating online resources					
Using technology skills in general					

Feedback

11. Please use this opportunity to offer any opinion and/or advice about your experience as a one-to-one technology school. Your comments will be anonymous and much appreciated.

Appendix K

Administrator Survey

Dear Administrator:

You are being asked to participate in the following survey because you are an administrator and the researchers are interested in teacher and administrator perceptions of laptop for high school students. Your input is very valuable.

Thank you for your time.

Administrators Survey:

1. My position is:
   - Superintendent
   - Principal
   - Assistant Principal

2. On average, how many hours per week (during school hours) do you believe students use of the school issued laptop computers?
   - 0-2 hours per week
   - 2-4 hours per week
   - 4-6 hours per week
   - 6+ hours per week

3. On average, how many hours might students spend using laptops at home to complete assignments.
   - 0-2 hours per week
   - 2-4 hours per week
   - 4-6 hours per week
   - 6+ hours per week

4. Please rate the degree to which students were engaged before the laptop initiative.
   - 1 – not at all engaged
   - 2 – slightly engaged
   - 3 – somewhat engaged
   - 4 – very engaged
   - 5 – extremely engaged

5. Please rate the degree to which students were engaged after the laptop initiative.
   - 1 – not at all engaged
   - 2 – slightly engaged
   - 3 – somewhat engaged
   - 4 – very engaged
   - 5 – extremely engaged

6. Please rate the degree to which you believe school issued laptops may have affected students' last nine weeks' grades in your content area.
   - Negatively Affected Grade Average
   - Somewhat Negatively Affective Grade Average
   - No Effect
   - Somewhat Positively Affected Grade Average
   - Positively Affected Grade Average

7. How often do you believe laptops are used during the following activities in your school.

	Never	Rarely	Sometimes	Often	Always
Lecture					
Discussion					
Memorization exercise					
Drills and practice assignments					
In-class Research					
In-class Reading					
In-class Writing					
Project involving problem solving					
Projects involving analysis of data					
Ability to create an original product					

8. How often do your students use the school-issued laptops for the following activities:

	Never	Rarely	Sometimes	Often	Always
Note-taking					
File storage					
Homework completion					
In-class assignment completion					
Finding information					

Other (please specify)

9. On average, how many hours per week do you spend with school-issued laptops doing the following activities?

	Never	Between 0-2 hours	Between 2-4 hours	Between 4-6 hours	More than 6 hours
Email					
Social Networking					
Instant Messaging					
Chat Rooms					
Blogging					
Mobile Blogging (twitter)					
Gaming Online					
Voice Chat (Skype, etc.)					
Making and sharing movies					
Making and sharing photos					
Creating digital music					
Podcasting videocasting					
Internet Surfing					
Listening to Music					

10. How prepared are your students in the following areas:

	No Option	Not Prepared	Poorly Prepared	Adequately Prepared	Well Prepared
Using technology for communication					
Using technology for expressing themselves artistically					
Using technology for working with others (collaboration)					
Using technology for research					
Using technology for analyzing and problem solving					
Using technology for evaluating online resources					
Using technology skills in general					

Feedback

11. Please use this opportunity to offer any opinion and/or advice about your experience as a one-to-one technology school. Your comments will be anonymous and much appreciated.

Appendix L

IRB Consent

University of Nebraska Lincoln

June 23, 2014

Brian Maschmann
Department of Educational Administration
7535 Bowman Cir Firth, NE 68358

Jody Isernhagen
Department of Educational Administration
132 TEAC, UNL, 68588-0360

IRB Number: 20140614385 EX
Project ID: 14385
Project Title: ONE-TO-ONE LAPTOP INITIATIVE: PERCEPTIONS OF TEACHERS AND ADMINISTRATORS

Dear Brian:

This letter is to officially notify you of the certification of exemption of your project by the Institutional Review Board (IRB) for the Protection of Human Subjects. It is the Board's opinion that you have provided adequate safeguards for the rights and welfare of the participants in this study based on the information provided. Your proposal is in compliance with this institution's Federal Wide Assurance 00002258 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46) and has been classified as Exempt Category 2.

You are authorized to implement this study as of the Date of Exemption Determination: 06/23/2014.

1. The stamped and approved signed informed consent document has been uploaded to NUgrant (files with Ã¢Â€Â“Approved.pdf in the file name). Please distribute this document to participants. If you need to make changes to the document, please submit the revised document to the IRB for review and approval prior to using it.

2. Your project has received approval to be conducted at Asland-Greenwood, Holdredge, Lexington, Westside Schools and Alliance Public Schools. Additional sites can be added on a case by case basic as permissions are submitted to the IRB.

We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:
* Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was

unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
* Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
* Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
* Any breach in confidentiality or compromise in data privacy related to the subject or others; or
* Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This project should be conducted in full accordance with all applicable sections of the IRB Guidelines and you should notify the IRB immediately of any proposed changes that may affect the exempt status of your research project. You should report any unanticipated problems involving risks to the participants or others to the Board.

If you have any questions, please contact the IRB office at 472-6965.

Sincerely,

Becky R. Freeman, CIP
for the IRB