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

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

By

Damon McDonald

A DISSERTATION

Presented to the Faculty of
The Graduate College at the University of Nebraska
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ONE-TO-ONE LAPTOP INITIATIVE:
PERCEPTIONS OF TEACHERS AND ADMINISTRATORS

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University of Nebraska, 2015

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The purpose of this explanatory mixed methods study was to explore the perceptions of teachers and administrators about the one to one laptop initiative in Nebraska schools. Parallel studies from the five largest and five smallest school districts were identified by the Nebraska Department of Education School Finance Formula and Organization Services. High schools in each district were chosen that have had one-to-one laptop initiatives for four or more years. The study examined teachers and administrator perceptions regarding: (a) the one-to-one implementation, (b) student engagement, (c) student grades, (d) benefits of one-to-one technology, and (e) the continued success of one-to-one initiatives.

The major findings of the study for both administrators and teachers were generally positive about the implementation of the one to one laptop initiative. They also believed the initiative helped with student engagement as a tool for learning. The teachers and administrators didn't think the initiative increased students' grades, however once the laptop was implemented correctly it reinforced students' interest in their specific content areas. Differences of opinion from the teachers and administration were found in the implementation of the laptop initiative. Teachers and administrators were positive about the added value of a technology initiative in their school system. A successful

implementation process fostered more commitment from teachers to use the device in the classrooms, which increased 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 teachers that were a part of the original implementation process believed it was a more collaborative effort and wanted to use the technology for content engagement. It was a smoother and quicker transition compared to school districts with a top down implementation approach.

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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 will be 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 has 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.

Definition 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 will be invited to participate. This process was followed until ten school districts have 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 believed that they were no longer teaching and their classrooms had become technology centered and not instruction centered causing them 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 sheer 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 intertwining 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 believed 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 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 (Kusssmaul & 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 (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.

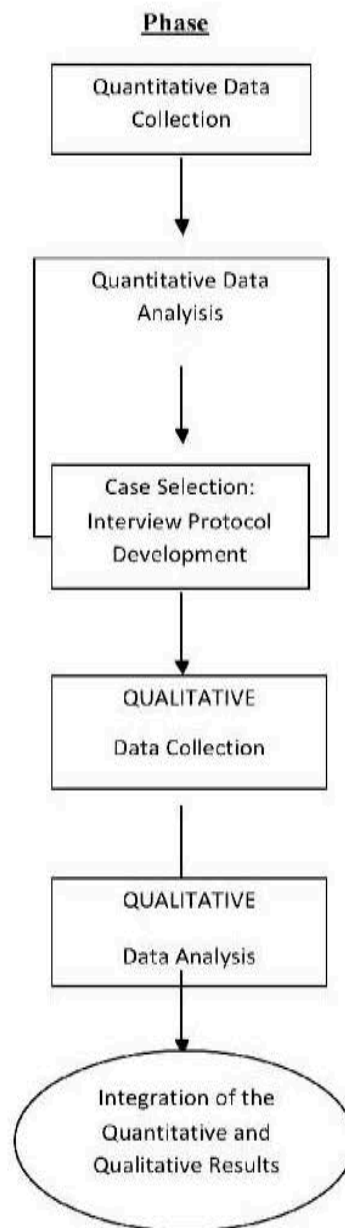


Figure 1. Mixed methods explanatory sequential design procedures.

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 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 when 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 is 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 smallest Nebraska public schools that have one-to-one laptop 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 largest Nebraska public schools that have one-to-one computer initiatives was also conducted by Brian Maschmann, allowing researchers to compare perceptions of administrators and teachers.

Research Questions and Hypotheses

The study focused on the 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 smallest 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 33 educators was provided by the 5 smallest schools with a one-to-one computer initiative for 4 or more years. The potential respondents included 8 administrators and 25 teachers. Of the 33 educators who were invited to participate in the parallel studies, 29 completed the survey (84.8% of the potential participants) (see Table 1).

Responses for teachers were organized around the four core teaching content areas. There were seven responses in the largest content area came from those teaching in English. Other areas represented in the survey included six teachers in mathematics, five in science, and two in Social Studies (see Table 2).

Table 1

Survey Response Rate by Educators from the Five Smallest Schools

Source	Sample	Respondents	%
Teacher	25	21	84.0
Administrators	8	8	100.0
Total	33	29	84.8

Table 2

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

Source	N = 20	%
English	7	33
Mathematics	6	29
Science	5	24
Social Studies	2	10

Responses for administrators were divided into two leadership areas, Superintendent and Principal. The 5 superintendent responses were 62.5% of the administrators surveyed and the 3 principal responses were 37.5% (see Table 3).

Table 3

Survey Response Rate by Administrator in the Five Smallest Schools

Source	N = 8	%
Superintendent	5	62.5
Building Administrator	3	37.5

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.

The five smallest 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 the district and have implemented one-to-one initiatives for four or more years.

Findings: Phase I Quantitative Data Survey Results

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

Research question #1. Established the participants 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 school 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. The difference between teachers and administrators perceptions on the degree to which students were engaged after the laptop initiative was not significant ($p < .05$).

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. A significant difference existed between teachers and administrators perceptions of how often laptops were incorporated with classroom lectures ($p < .05$) (see Table 4). The administrators had a mean quality rating of 5.7500

Table 4

Comparison of Student Engagement After Laptop Initiative

F	Sig.	t	df	2-tailed
5.830	.023	-.933	26	.359

(SD = 1.66905), whereas the teachers had a mean rating of 4.9000 (SD = 2.33734). The administrators had a significantly higher mean rating than the teachers in the perception of incorporated use of laptops with lecture activities in classrooms.

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 5.0000 (SD = .92582), whereas the teachers had a mean rating of 4.2000 (SD = 2.21478). 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.

Table 5

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

F	Sig.	t	df	2-tailed
7.195	.013	-.979	26	.337

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 ($p < .05$).

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

Research question #10 results. The difference between teachers and administrators perceptions on how often do you incorporate the use of laptops with drill practice assignments was not significant ($p > .05$).

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

Research question #11 results. The difference between teachers and administrators perceptions on how often do you incorporate the use of laptops with in-class research was not significant ($p > .05$).

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

Research question #12 results. The difference between teachers and administrators perceptions on how often do you incorporate the use of laptops with in-class reading was not significant ($p > .05$).

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 in-class writing. ($p < .05$) (see Table 6). The administrators had a mean quality rating of 6.6250 (SD = 1.50594), whereas the teachers had a mean rating of 5.5500 (SD = 2.52305). 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 6

Comparison of the Degree to Incorporate the Use of Laptops with In-class Writing

F	Sig.	t	df	2-tailed
9.020	.006	-1.120	26	.273

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

Research question #14 results. The difference between teachers and administrators perceptions on how often do you incorporate the use of laptops with project involving problem solving was not significant ($p > .05$).

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. The difference between teachers and administrators perceptions on how often do you incorporate the use of laptops with projects involving analysis of data was not significant ($p > .05$).

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. The difference between teachers and administrators perceptions on how often do you incorporate the use of laptops with ability to create an original product was not significant ($p > .05$).

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. The difference between teachers and administrators perceptions on how prepared students were in using technology for expressing themselves artistically in the classroom was not significant ($p > .05$).

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. The difference between teachers and administrators perceptions on how many hours per week they spend with school-issued laptops doing email was not significant ($p > .05$).

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. A significant difference existed between teachers and administrators perceptions of how many hours per week they spend with school-issued laptops doing social networking activities ($p < .05$) (see Table 7). The

administrators had a mean quality rating of 1.6250 (SD = .51755), whereas the teachers had a mean rating of 2.2500 (SD = 1.58529). The teachers had a significantly higher mean rating than the administrators in the perception of how many hours per week they spend with school-issued laptops using social networking.

Table 7

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

F	Sig.	t	df	2-tailed
6.290	.019	1.081	26	.289

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

Research question #25 results. A significant difference existed between teachers' and administrators' perceptions of how many hours per week students spend with school-issued laptops doing instant messaging activities ($p < .05$) see Table 8). The administrators had a mean quality rating of 1.0000 (SD= .00000), whereas the teachers had a mean rating of 1.8500 (SD= 1.03999). The teachers had a significantly higher mean rating than the administrators in the perception of how many hours per week students spent with school-issued laptops using instant messaging.

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

Table 8

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

F	Sig.	t	df	2-tailed
9.830	.004	2.285	26	.031

Research question #26 results. A significant difference existed between teachers' and administrators' perceptions of how many hours per week students spend with school-issued laptops using chat rooms ($p < .05$) (see Table 9). The administrators had a mean quality rating of 1.0000 (SD = .00000), whereas the teachers had a mean rating of 1.2500 (SD = .44426). The teachers had a significantly higher mean rating than the administrators in the perception of how many hours per week they spent with school-issued laptops using chat rooms.

Table 9

Comparison of the Degree to Observe How Many Hours Per Week Teachers and Administrators Spend with School-issued Laptops in Using Chat Rooms

F	Sig.	t	df	2-tailed
22.286	.000	1.574	26	.128

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

Research question #27 results. The difference between teachers and administrators perceptions on how many hours per week students spend with school-issued laptops blogging was not significant ($p < .05$).

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. A significant difference existed between teachers and administrators perceptions of how many hours per week they spend with school-issued laptops doing mobile blogging activities ($p < .05$) (see Table 10). The administrators had a mean quality rating of 1.0000 (SD = .00000), whereas the teachers had a mean rating of 1.2500 (SD = .44426). The teachers had a significantly higher mean rating than the administrators in the perception of how many hours per week they spent with school-issued laptops using blogging.

Table 10

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

F	Sig.	t	df	2-tailed
22/297	/---	1/584	27	.128

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. A significant difference existed between teachers and administrators perceptions of how many hours per week they spend with school-issued laptops voice chatting ($p < .05$) (see Table 11). The administrators had a mean quality rating of 1.5000 ($SD = .75593$), whereas the teachers had a mean rating of 2.4000 ($SD = 1.50088$). The teachers had a significantly higher mean rating than the administrators in the perception of how many hours per week they spent with school-issued laptops using voice chat.

Table 11

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

F	Sig.	t	df	2-tailed
5.025	.034	1.604	26	.121

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. A significant difference existed between teachers and administrators perceptions of how many hours per week they spend with school-

issued laptops making and sharing movies. ($p < .05$) (see Table 12). The administrators had a mean quality rating of 1.1250 ($SD = .35355$), whereas the teachers had a mean rating of 1.7500 ($SD = 1.20852$). The teachers had a significantly higher mean rating than the administrators in the perception of how many hours per week they spent with school-issued laptops using making and sharing movies.

Table 12

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

F	Sig.	t	df	2-tailed
5.628	.025	1.413	26	.169

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 movies 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. A significant difference existed between teachers' and administrators' perceptions of how many hours per week they spend with school-issued laptops doing podcasting activities ($p < .05$) (see Table 13). The administrators had a mean quality rating of 2.2500 (SD = .70711), whereas the teachers had a mean rating of 3.5000 (SD = 1.43270). The teachers had a significantly higher mean rating than the administrators in the perception of how many hours per week they spent with school-issued laptops podcasting.

Table 13

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

F	Sig.	t	df	2-tailed
8.054	.009	2.337	26	.027

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 do 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 were collected in Phase II of the study through personal interviews with 20 teachers and 8 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 the 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 14).

Table 14

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 15).

Phase II: Qualitative themes for administrator. The themes of the Phase II qualitative study for the five smallest 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.

Table 15

Themes and Codes from Interviews of Administrators and Teachers

1.	Perceptions of teachers/administrator of the implementation	
	a. Instructional purpose	17
	b. Level playing field	9
	c. Give opportunities to students	14
	d. Use technology outside the classroom	16
	e. Technology integration	10
2.	Perceptions of student engagement	
	a. Student learning	16
	b. Access to the internet	13
	c. Student motivation	15
	d. Improved communication	17
	e. Connect with the students	8
3.	Perceptions of student grades	
	a. Use as a tool	20
	b. More engaged for learning	14
	c. Aware of assignments	15
	d. A resource	7
4.	Benefits of one-to-one technology	
	a. Student engage	14
	b. Digital citizenship	10
	c. Faster paced	13
	d. Enrichment of curriculum	6
	e. Supplementary instruction	9
5.	Perceptions of continued success of one-to-one initiatives	
	a. Worth implementing	19
	b. Best for students	15
	c. Financial implications	9

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 provide classroom efficiency, collaboration and blended educational opportunities. The administration wanted to place technology in the hands of teachers and students to enhance educational experiences within blended environments. Administrators and teachers believe that implementation of the one-to-one initiative would also level the playing field for many students that didn't have access to a laptop or other device at home. One administrator said,

Our main purpose for the laptop initiative was because we are so remote and isolated we wanted our students to have the highest possible skills when they entered college. We thought getting laptops in their hands would get them familiar with blended classrooms and textbooks online to better prepare them for college and life on a ranch. We wanted to bring the world to our students instead of trying to bring them to the world.

Another said,

Simply, that is the direction all education is heading and it is impossible to do our work in school, in the classroom or on tests without the latest technology for our students to be able to learn better and get a better handle of the latest technology, the jury is still out as to how effective it is going to be.

Another administrator commented on the improved connectability technology as provided for their district, "Students are gone a lot so there was a disconnect between students and the classroom. By going one-to-one we are able to have an online platform for students to be able to complete their homework while traveling to various school events." Overwhelmingly the administrators summarized the one-to-one laptop initiative as a tool for students and teachers to utilized in their daily lives to enhance research and the delivery of information.

Theme II: Perceptions of student engagement. Every administrator interviewed commented about how the one-to-one laptop initiative improved student engagement.

Students are a lot more engaged and enthused about their learning because of the extra resources. Teachers have set up blended learning environments for the students, encouraging them to become more independent. The students use an online resource called Moodle for downloading the course or the lesson for the day. They take assessments on the laptop, which helps to prepare them for college and the independence of learning anywhere anytime.

Another said,

I have seen students who maybe wouldn't have taken the time to look up something in a book, but will if they can do it online. The immediate feedback from online lessons keeps them more engaged, the laptops have provided a means to be actively involved in a lesson instead of simply taking part in a lecture format.

Administrators indicated that today's students have a multitude of devices to use to enhance their daily lives. One administrator stated,

The kids love technology and would rather have it in their hands than a notebook. I think it has taught them the responsibility of taking care of the laptop and they seem to be more engaged in the classroom using a powerpoint for presentations. Most of their assessments are online which has really enhanced their educational experiences.

Another said, "It adds another level of interest by mimicking smartphones, which seems to draw more interest from our students. Any time you have visuals it heightens their interest." Administrators agree that the one-to-one laptop initiative does provide an opportunity for students to learn at their own pace and allows teachers to develop a layered approach to student learning.

Theme III: Perceptions of students' grades. Administrators had mixed beliefs about the impact of the one-to-one laptop initiative and student grades. Some believed student grades improved while others thought the laptops didn't have a direct effect on

grades. However, all eight administrators agreed the laptops did have an effect on student participation and engagement. One administrator indicated,

I believe it has helped some students grow through their learning process by providing research at their fingertips. It has minimized the use for research in the library. I am not sure it has helped those students that have difficulty with reading and comprehension, but the technology does provide assistance for the students.

Another Administrator stated,

I don't have hard data to say our grades have increased or decreased. I think the laptops are more of a learning tool instead of using a piece of paper and pencil for school tasks, students have said they are more enthused about being in a classroom with laptop technology.

An administrator interviewed indicated,

I don't know there is a huge impact on academic grades, but the laptops have created an ease for finding information for each assignment. It certainly has challenged and motivate kids in different ways as they seem much more organized to get their schoolwork completed. I am not sure they do better, but they have more opportunities and create more progressive ideas when tackling school projects.

Another administrator revealed that student grades seemed to improve with the introduction of the one-to-one laptop initiative.

Reports I receive from teachers indicated that there are very few incomplete assignments now as the laptops can be taken home and used all the time. We have seen a rise in grades because of the 24/7 access to the laptops.

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.

Theme IV: Benefits of one-to-one technology. Seven of the eight administrators interviewed commented on an interactive environment for all students using the laptops.

The benefit is the interaction the laptop has created with the students, what I see is our students using pair sharing techniques all the time, more online learning, and more AdvancED classes. It has become a part of the students' language.

Students are using their computers for any and all class projects as it has become a common part of our daily language.

Another administrator stated “We believe we have more independent learning taking place than in prior years because students can get any answer they need from the Internet. Our classrooms have become less teacher centered learning environments to more student centered learning environments.” Instant feedback is important in today’s society as the laptops along with our technology systems provide students with instant information and feedback.

The benefits expressed from teachers to administrators focused on resources and enhancement. As one administrator stated,

teachers have more access to additional resources, which has increased the number of activities they use in their classrooms. It really depends on their level of creativity and how they can tie their lessons together. In my opinion, teachers see it as a huge benefit for them so they don’t have to do so much work outside of the classroom.

Another indicated, “It has forced teachers to enhance the interest of their content area.

There isn’t any boundaries with the use of a laptop as cloud technology provides so many more opportunities for teachers and students to collaborate.”

The administrators observed other benefits as the teachers developed new ways to incorporate the laptops and different programs into their classrooms. When asked about the different types of activities the teacher incorporated into the classroom the responses varied. One administrator stated,

It depends on the teacher as some take longer to embrace the technology than others, however, I am seeing more flipped classrooms where the teachers are facilitating their classrooms as students view the video or tutorial of the lesson on their laptop. The teacher then gives the students more class time to provide more individualized instruction for each student.

Another indicated,

We have gone to Google apps for education. Teachers have created web pages to help communication between parents and students because most of their lesson plans are online. Teachers have brought in additional software packages to supplement what they are incorporating in their classrooms to engage their students. We haven't delved into a lot of social media opportunities yet, but we are considering it in the future to continue to improve our communication skills.

Theme V: Perceptions of continued success of one-to-one initiatives. The development of a successful one-to-one laptop initiative seems to have many factors. Administrators sighted the financial implications for the districts to maintain the current devices and update the network infrastructure to meet the demands of the students and staff. They also noted a commitment from the school board, the community and the staff for continued development and learning opportunities. One administrator stated,

It is another level of responsibility for us and the staff as we have to make sure students are using the technology in the proper manner. I am fearful of becoming desensitized to what is or isn't important of the core curriculum and what needs to be taught and retained by the students as they move forward in life, at college or at a tech school.

Another indicated,

We need constant support and we need to find ways to help get the technology in the hands of the people that need it. We need to make sure they understand what the tool can be used for providing some professional development and the proper support so they don't give up on the technology.

Administrators interviewed believed that the one-to-one initiative was worth implementing. One administrator said,

I believe our constituents, students and teachers have bought into it. At first there was a little concern however we needed to consider the types of technology the kids are using to help keep them engaged. I would make sure from the beginning of the process the kids understand it is a tool to assist their learning process not a tool for entertainment purposes.

Another stated,

Definitely worth it because students are working on the laptops for school assignments after school when I see them in the community. Where we live we have very few homes with computers in them so this was a way to bring the 21st century into their homes and to the students.

One administrator's perspective on technology and society stated,

Yes, peace of mind because our society is moving this direction, you either stand still or get on the train. We are on the train as we see this type of technology being incorporated into the higher levels of educational institutions, so the students need to have familiarity with technology. I am glad we have it. The bottom line is we all want to know how effective is it for our students if we move the clock up five years from now so we can determine if these devices have made any educational difference.

Phase II: Qualitative themes 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 mostly positive perceptions of the one-to-one laptop initiative. Teachers indicated the implementation was driven by a team of teachers on a technology committee who presented their findings to the administration and board of education. One teacher said, "It was our principal and business teacher who presented the technology committee's findings to the school board focused on keeping up with surrounding districts and technology in general." Another stated, "The technology committee of teachers and the technology coordinator provided input for all building levels, using a needs assessment to evaluate what type of technological device to implement for the district." Allowing the teachers and other staff members to have input into the educational decision affecting their classrooms can change the implementation of a one-to-one initiative. Several

teachers indicated the success of implementing a one-to-one initiative is higher when a grassroots effort is involved.

One teacher indicated having access to a laptop a semester prior to the roll out date for students was beneficial. This gave the teachers time to develop and learn how to utilize the technology before the students were issued their laptops. Another teacher said, "I am excited the school board provided the necessary finances for the technology initiative as our students and teachers have more opportunities to grow with technology as it affects our everyday lives." Still another teacher spoke of the utilization of REAP (Rural Education Achievement Program) grants to help supplement the purchase of laptops for every one of their high school students.

Theme II: Teacher perceptions of student engagement. The responses on student engagement varied from effective teacher and student communication to visually seeing the students initiate more projects. Teachers wanted to maintain the idea of the content leading the use of technology not the technology leading the content.

A teacher that utilizes the one-to-one laptop initiative stated, "The students seem more attentive and the quality of their work is better, however if not monitored they tend to stray away from educational apps and focus more on gaming." Another indicated, "My math students are learning at their own pace with online resources, nobody gets left behind as the students are more engaged as the laptop makes the learning process more dynamic."

With cloud applications on the Internet, teachers and students have 24/7 access to class information, grades, email applications, video communications and online lessons using Youtube. The students can collaborate with other students and their instructors at

any location on a daily basis. One teacher stated, “The real time collaboration and communication between both students and teachers has increased the student’s interest in the learning objectives. The communication has become clearer between parents, students, teachers and administrators.” Another said, “I have recently incorporated the Flipped Classroom model as I wanted to change my classroom from teacher centered to more student centered. The students are held more accountable for their own learning.” The efficiency of flipped classrooms has been beneficial and having access to distant learning opportunities across Nebraska with other districts has become more of the norm.

Other teachers believe the one-to-one laptop initiative has limited student engagement in their classroom. They believe the laptop has become a distraction when not monitored properly. One teacher indicated, “It seems to have helped those students wanting to further their education but hindered those students that are easily distracted.” Another said, “The students are more attentive and their quality of work is better, however if they aren’t monitored they tend to stray away from the approved educational applications.”

Theme III: Teacher perceptions of student grades. The perception of students receiving higher grades due to the availability of the laptop has had mixed reviews by teachers. Many teachers believed student engagement in their classroom had improved with the addition of the laptop and the Internet, however it isn’t the sole reason why a student’s grade would necessarily increase. The laptops were purchased as a tool to use to give access to research and collaboration among students and staff. One teacher said, “It depends on the type of student. If they are easily distracted the laptop hinders their progress in the classroom because of the instant access to apps on the internet.” Another

indicated, “If the students take advantage of the devices capabilities it has improved their grades, but can be a distraction because of all capabilities it has to offer, they sometimes lose focus on the task at hand.”

A teacher explained the one-to-one initiative has improved communication between home and school positively affecting the grades of her students.

Through our student management software students and parents can track grades daily on using their laptops, putting the control of their grade in their own hands. Grades have seemed to improve because of the unfettered access to real time data.

Another had mixed believes stating, “Motivated students will still work hard whether they have a computer or not, grades have not necessarily improved by simply providing each student a laptop.”

The majority of teachers indicated the laptops have provided more creation within their classrooms. “The laptop has provided students the opportunity to become more independent learners, giving them more opportunities to be more creative instead of using simple paper pencil homework and tests.” One teacher indicated, “The students seem more focused on the subject matter, they seem more engaged, which has improved their grades.”

Theme IV: Benefits of the one-to-one technology. Teachers had many different thoughts on the benefits of the one-to-one laptop initiative in their classrooms. They could see the benefits of collaborating with other classrooms around the world and having access to daily lesson plans anywhere at any time. A teacher stated, “The laptops provide easy access to the Internet and if they miss class they have access to all of my notes and videos through my archived lessons.” Another indicated,

Most of the classroom material is located on their laptop. If they miss class they can gain access to the missing information instantly. The laptops provide my students access to all classroom documents at any time, which assist them in developing technological skills for success in career related fields later in life.

The immediate access to data is a positive for students as a teacher stated, “I like the fact the students have immediate access to resources that would other wise be difficult to obtain, and the sharing of classroom lessons and learning from other students has improved.” If used appropriately the laptop should provide students and staff easier access to relevant information becoming more efficient and effective in their learning process. “My classroom instruction has become more relevant and the students are enjoying the fact that they can learn at their own pace.”

We are immersed in all kinds of technological advancement in this modern era. The student’s utilization of the technology has improved the efficiency and productivity of curricular areas. A teacher indicated,

The ease of access and completion of projects has improved. There is less switching between classes to gain access to computer labs, and improvements to cloud storage has helped create an ease of transferring information between their homes and the school.

The benefits of the one-to-one laptop initiative reported by the majority of teachers indicated student engagement had improved and the technology seemed to be getting them ready for real life scenarios.

Theme V: Teacher perceptions of continued success of one-to-one initiatives.

The continued success of the one-to-one initiative should pay special attention to the implementation process, beginning and continued professional development opportunities, hardware maintenance and the types of educational software applications. The reliability of the technology infrastructure will make or break the continued success

of the one-to-one technology initiatives. “I would like to see more courses for the use of technology and more training for teachers who are uncomfortable with certain aspects of technology.” Another teacher stated,

I believe if our district is going to have continued success we need to stay current with our professional development and training opportunities centered around the technology devices. Staying up-to-date with the current times and making sure the technology is relevant is so important.

A third teacher indicated,

I would like to see less access to gaming and social media apps during the school and focus more on a digital citizenship program for students and staff. I would appreciate more direction on the competency of general computer use and professional development in the digital world of educational apps.

Other teachers focus on technology in general as they look at the future within their educational environments.

I think we need more courses designed for independent learning. Online courses, AdvancED courses and more professional development for staff are key.” Another teacher said, “It is important to stay with the times and provide the latest technology for students and staff to guide their educational journey.

Summary

This chapter presented 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 smallest 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 smallest 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 smallest districts with one-to-one laptop initiatives was conducted in conjunction with a parallel study of teachers and administrators’ perceptions of the five largest schools completed by Brian Maschmann. 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 smallest schools that had one-to-one laptop initiatives for 4 or more years. If a school chose not to participate in the study, the next smallest school in student enrollment was asked to participate. Superintendents from the smallest school districts recommended administrators and teachers from the 5 school districts. Approximately

84.8% of the 33 combined administrators and teachers were sent the survey. Of a potential 33 teachers and administrators, 29 submitted the survey.

Discussion

The findings of this study were organized around the administrators and teachers perceptions of a one-to-one laptop 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 36 questions with 10 questions having a significant difference in perceptions between teachers and administrators. Questions that had no significant differences were, questions 2-6, 9-12, 14-23, 27, 29, 32, 33, 35, and 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 the use of laptops within the lecture activities in the teachers' classrooms.

Discussion of findings for research question 7.

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

The administrators' responses to the survey questions were significantly different than that of the teachers. The administrators mean quality rating was 5.7500 compared to the teachers mean score of 4.9000. Administrators believed teachers incorporated the use of laptops into the classrooms during lecture activities more than the teachers' perceptions. The perception of the administration on use of the laptops could be a result of less interactions or daily walkthroughs within the classrooms. Since the teachers are in control of their daily lessons they maybe have a better understanding of the use of laptops during their lessons than the administrators. The teachers' usage perception maybe less than the administrators due to their daily interaction with the laptops and their current organization of their daily lesson with or without the laptops.

Discussion of findings for research question 8 and 13. The survey questions 8 and 13 were included 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 teacher's significant difference in the mean scores for each response. For these questions the administrators had the 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 5.0000 compared to the teachers mean score of 4.2000.

Research question 13. How often do you incorporate the use of laptops with in-class writing activities in your classroom? The administrators mean quality rating was 6.6250 compared to the teachers mean score of 5.5500.

The administrator's perceptions to the survey questions were significantly different than that of the teachers. They believed that the teachers were utilizing the use

of laptops in the classroom for discussion and in-class writing. The teachers did not believe these practices were used as much as the administration. The difference in the perceptions maybe due to the teachers' daily observations and use of the laptops during their classroom lessons compared to the administrators. The administrators seemed more removed from observing and communicating with the teachers and students on how the laptops were used in certain classroom activities such as in-class writing projects and during discussion activities. The administrators' perception maybe based on the formal and informal observations and communication with the staff and students. The administrators were more removed from the day-to-day operation in the classroom and relied on observations and interactions with teachers and staff when developing their perception of how teachers use the laptops in their districts.

Discussion of findings for research question 24, 25, 26, 28, 30, 31 and 34.

These survey questions were included in the survey as a grid style format. The questions for this section have been sorted by the administrator's significant difference of mean scores and the teacher's significant difference of mean scores in each response. In this set of questions the teachers had a higher mean rating.

Research question #24. On average, how many hours per week do you spend with school issued laptops doing social networking activities? The teachers mean quality rating was 2.2500 compared to the administrators mean score of 1.6250.

Research question #25. On average, how many hours per week do you spend with school-issued laptops doing the instant messaging activities? The teachers had a mean quality rating of 1.8500 compared to the administrators had a mean quality rating of 1.0000.

Research question #26. On average, how many hours per week do you spend with school-issued laptops doing chat room activities? The teachers had a mean quality rating of 1.2500 compared to the administrators who had a mean quality rating of 1.0000.

Research question #28. On average, how many hours per week do you spend with school-issued laptops doing mobile blogging activities? The teachers had a mean quality rating of 1.2500 compared to the administrators had a mean quality rating of 1.0000.

Research question #30. On average, how many hours per week do you spend with school-issued laptops doing voice chat activities? The teachers had a mean quality rating of 2.4000 compared to the administrators had a mean quality rating of 1.5000.

Research question #31. On average, how many hours per week do you spend with school-issued laptops making and sharing movies activities? The teachers had a mean quality rating of 1.1250 compared to the administrators had a mean quality rating of 1.7500.

Research question #34. On average, how many hours per week do you spend with school-issued laptops doing podcasting activities? The teachers had a mean quality rating of 3.5000 compared to the administrators had a mean quality rating of 2.2500

The teachers' perceptions to the survey questions were significantly different than that of the administration. The teachers believed they utilized laptops in the classroom for social networking, instant messaging, chat room, mobile blogging, voice chat, making and sharing movies, and podcasting. The administration did not believe these practices were used as much as the teachers did. Teachers' perceptions may be derived from a better understanding of what their expectations are with the laptops in the classroom than the administration. The teachers created lesson plans with more hands on activities for

students, utilizing the laptop as learning tools for creativity and student centered activities.

Qualitative findings. Themes were identified from interviews with 25 teachers and 8 administrators. The 5 themes were: (a) perceptions of teachers and administrators 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 of the administrators appeared to be more focused on the success of all students. They believed that the implementation of the one-to-one laptop initiative leveled the playing field for all students. One administrator stated, “We are so remote and isolated we wanted our students to have the highest possible skills.” The administrators also believed that technology was very important to the district, as it allows students and teachers to utilize the laptops as a tool for learning everyday all day.

Teachers had mixed responses about the one-to-one initiative. The majority of teachers believed the laptop initiative focused on student learning, however some wished the process would have involved a greater grassroots effort with more input from teachers. Most teachers believed the school district used the proper procedures for implementing the laptop initiative through the district’s technology committee’s recommendations to the administration and finally receiving board approval. One teacher talked about one aspect of his school district’s implementation process, “I really appreciated having access to the laptop for one semester before the students received

theirs.” Others thought the initiative was implemented because of Rural Education Achievement Program grants. The funds for this grant had a “use it or lose it” stipulation and the technology initiative was one category the grant recognized for the funds. The teachers in these grant-funded initiatives were a little skeptical at first, but now wouldn’t consider developing lesson plans without the access of their district’s laptop initiative.

Perceptions of student engagement. Every administrator interviewed said they thought the one-to-one laptop initiative increased student engagement. Those interviewed focused on the students using the laptops as a tool for learning. The implementation of the technology initiative created more engagement opportunities for the students. One administrator stated, “I have seen students who maybe wouldn’t have taken the time to look up something in a book, but will if they can do it online.” The administrators that had implemented one-to-one computer initiatives in their buildings noticed increased student motivation, engagement, and creativity across the curriculum.

Teachers had many different thoughts about student engagement due to the one-to-one laptop initiative. One teacher believed the laptops needed to play a role in the classrooms and the day-to-day activities in the school but still allowed the content to lead the learning process. The laptop and the technology infrastructure can help enhance the content of the lesson making the content more engaging. Students can use the computers to communicate with other students or staff day or night. One-teacher stated, “Communication between the students and teachers has increased the students’ interests in their learning process.” Other teachers have used the laptop to flip their classroom management style. They are using a technique called “flipped classrooms,” where they have become the facilitator of student centered learning. Their lessons are watched at

other times during the day and the classroom time is used as a reinforcement of the digital lesson plan. Most teachers reflected that if used correctly the laptops could provide more engagement opportunities for students however good classroom management is the key as it can be easy for students to stray from their districts approved educational applications.

Perceptions of student grades. Administrators had mixed beliefs about the impact that the one-to-one initiative had on student grades. Some of the administrators that were interviewed believed the one-to-one laptop initiative didn't have a direct effect on student grades but did have an effect on student participation and engagement. One administrator stated, "Students have said they are more enthused about being in a classroom with laptop technology." The laptop initiative created more student interest and engagement in the classroom lessons, which had an indirect effect on student grades.

The majority of teachers also had similar thoughts. The teachers believed the laptops were great tools for learning and keeping students focused on the subject matter. Some teachers believed student engagement had increased, but definitively couldn't stipulate it was the sole reason some students' grades increased. One teacher indicated, "If a student would take advantage of the laptop's capabilities, it did improve their grades in my class." The majority of teachers did indicate the heightened creativity of students through the use of laptops has been a positive for their district.

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 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, which created more opportunities to become stronger independent learners. Teaching with technology also was more efficient when used as a tool as the classrooms have become more student centered.

Teachers have many different views on the benefits of the one-to-one laptop initiative in schools. Some teachers appreciated the combination of the laptops with the Internet. Their students had access to all of their classroom materials whether they were in class or not. A teacher indicated, “The students have access to all of the classroom documents at anytime, enhancing communication between them, and provides a more efficient means of collecting classroom work.” 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.

Perceptions of continued success of one-to-one initiatives. Administrators 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 stated, “You either stand still or get on the train.” He was concerned about the desensitization of students and their learning process, however he also indicated the laptops were beneficial if used as a tool in the learning process with less emphasis on the entertainment aspects of technology.

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. One teacher stated, “We need to stay current with our professional development opportunities as the technology continues to develop and advance.” Technology changes at a rapid pace and the next big idea will be outdated the minute it is placed on the market. Some teachers believe it doesn’t matter what type of device is being used to create more engagement. One teacher reflected, “It is becoming more about the trends centered around digital formats, online classrooms, online assessments and fostering independent learning.”

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 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 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 districts 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 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 16).

Table 16

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 17).

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 17

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 students 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 students 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 and largest school districts 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 and the largest school districts 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 and the largest school districts 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 18).

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 believed 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 18

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 believed 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 schools 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 districts 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 give 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:

<u>Name</u>	<u>Position</u>	<u>Email Address.</u>
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:

<u>Name</u>	<u>Position</u>	<u>Email Address.</u>
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



June 30, 2014

Damon McDonald
 Department of Educational Administration
 770 Terrie Road Aurora, NE 68818

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

IRB Number: 20140614410 EX
 Project ID: 14410
 Project Title: ONE TO ONE LAPTOP INITIATIVE: PERCEPTIONS OF TEACHERS AND
 ADMINSTRATORS

Dear Damon:

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: 06/30/2014.

1. The stamped and approved informed consent documents have been uploaded to NUgrant (file with "Approved.pdf" in the file name). Please distribute these documents to participants. If you need to make changes to the documents, please submit the revised documents to the IRB for review and approval prior to using them.
2. You have received permission to conduct your research at the following institutions: Sioux County Schools, Wheeler Central Schools, Callaway & Arnold Public School District, Arthur County Schools and Thedford Public Schools. Additional sites will be added as permission letters are received by 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

