

EDUCATOR PERCEPTIONS OF A ONE TO ONE TECHNOLOGY INITIATIVE

JEFF MINGUS

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The undersigned, approved by the Department Chair of Graduate Studies in Education, have examined a dissertation entitled:

EDUCATOR PERCEPTIONS OF A ONE TO ONE TECHNOLOGY INITIATIVE

Presented by Jeff Mingus a candidate for the degree of Doctor of Education and hereby certify that in their opinion it is worthy of acceptance.

Dr. Tammy Condren, Advisor/Chair
Graduate Education

Dr. Jim Truelove, Committee Member
Department Head Graduate Education

Dr. Mick Arnold, Committee Member
Graduate Education

EDUCATOR PERCEPTIONS OF A ONE TO ONE TECHNOLOGY INITIATIVE

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Jeff Mingus, B.S., M.S., Ed.S

Dr. Tammy Condren, Dissertation Advisor

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CHAPTER ONE

INTRODUCTION

Traditional approaches to public education that are based upon educational systems built during the Industrial Revolution no longer fully prepare graduating students from high school with adequate skills to compete in global job markets (Schwahn & McGarvey, 2011). The public education process currently in place was developed during the industrial revolution where assembly line learning was an effective way to develop the skills that the students needed to be successful when leaving school and entering either the next level of education or the work force (Schwahn & McGarvey, 2011). This was an approach based upon a classroom where the teacher was the focus. The student was there to receive information and to be able to memorize that information and regurgitate it. The Industrial Age delivery system is an assembly line where time for learning is the constant and the quality of the learning is the variable (Schwahn & McGarvey, 2011, p. 5). Today, however, that approach is becoming antiquated. Individual needs and individual skills can now be developed by a much deeper and personalized instructional approach through changed pedagogy and infused technology. While technology is a major resource from which the student draws upon to assist them in acquiring knowledge, the pedagogy that is changing based upon the introduction of technology is the empowering piece affecting today's learners. Today's graduates must have skills that are being listed as critical thinking, problem solvers, and good communicators. Educational technologies have been shown to enrich learning environments and enhance student's conceptual understanding (Greenhow, 2008, p. 16).

Technology is becoming an integrated part of all facets of society. Technology has grown exponentially since and has developed in areas of industry, personal home life and into the works of public education. Students going through the educational process during this time must obtain an entirely different skill set to become successful citizens than those of the past. In order to properly prepare students for the 21st century, many schools may need to revise current curricula and incorporate training for teachers on how to integrate technology that engages and motivates students to learn (Ullman, 2007).

The change in approach to education to address this inadequacy is now focused, in some areas, on technology-enhanced education through the implementation of one to one technology initiatives. One to one technology initiatives are instructional approaches that differ in each school but, have common features such as:

(1) Providing students with use of portable laptop computers loaded with contemporary productivity software (2) enabling students to access the Internet through schools' wireless networks, and (3) a focus on using laptops to help complete academic tasks such as homework assignments, tests, and presentations (Penuel, 2006, p. 332).

According to the U.S. Department of Education (2008), educational technologies have been shown to enrich learning environments and enhance students' conceptual understanding. Developing learners with more skills and abilities to be conceptual thinkers as well as good communicators with problem solving skills will better establish the learners for integration to the technology rich environment that awaits them. One to one technology initiatives are designs that put a technology device in the hands of each student and that device becomes the tool or the resource guide for learning. The intent is

to embrace the world of experiences, knowledge and resource that technology has brought to the fingertips of the world and to harness it to provide the most personalized and deepest educational experience for each and every student.

Theoretical Framework

The increase of computers and technology into the classrooms in American public schools has been one of the most expensive educational reform projects in recent history. While the national ratio of students to computers has decreased from 125:1 in 1983 to 4:1 in 2002 (Bebell & Kay, 2010) and continues to drop, the real change in education is not only the technology device, but the educational theory that supports this move. This ratio continues to drop primarily due to the interest and excitement built around one to one computing. Studies have shown that one to one computing brings about increased student engagement, decreased disciplinary problems, increased use of computers for writing, analysis and research and a movement towards student-centered classrooms (Bebell & Kay, 2010).

The movement towards student-centered classrooms is an example of the educational theory that long ago began working toward one to one computing. Traditional classroom settings are still tightly aligned with the public education system that was created during the Industrial Revolution. The public education process that is in place was developed during the industrial revolution where assembly line learning was an effective way to develop the skills that the students needed to be successful when leaving school and entering either the next level of education or the work force (Schwahn & McGarvey, 2011).

Constructivism is a theory that opposes the traditional assembly line of the industrial revolution and has been linked to the introduction of one to one technology initiatives. Developed by Jean Piaget (1896-1980), constructivism examined the idea that students learn through the construction of one logical structure after another and mostly learn based upon their experiences. Constructivist classrooms are based on students' needs and interests as well as connecting curriculum to events and items that are relevant to the students' lives. The development of one to one computing into classrooms is a vessel of the constructivist theory. With 21st century skills such as critical thinking and problem solving representing such an approach, a classroom that has one to one computing would be hard pressed to successfully facilitate learning without the influence of constructivist theory.

Problem Statement

The implementation of a one to one technology initiative may be affected by teacher perceptions about 21st Century Learning as well as their perceptions about 21st Century Pedagogy. Educators who are entering this new realm of education have personal and professional beliefs as well as values and practices that will be tested by evolving into one to one technology instruction. Each educator's individual perceptions will differ. This study was designed to determine what educator's perceptions are regarding one to one technology based instruction specifically focused on their perceptions about 21st Century Learning and 21st Century Pedagogy. This study was also designed to provide information that will be essential for providing school districts guidance for developing professional development and training for teachers who are preparing to teach using a one to one technology initiative.

Rationale for the Study

This study was designed to determine educator's perceptions in regard to 21st Century Skills and 21st Century Pedagogy that are involved with implementation of a one to one technology initiative. This study was also designed to provide information that will be essential for providing school districts guidance for developing professional development and training for teachers who are preparing to teach within a one to one technology initiative.

Research Questions

This study was designed to answer the following research questions:

1. What perceptions, in regard to 21st Century Skills, are held by educators who are involved with a one to one technology initiative?
2. What perceptions, in regard to 21st Century Pedagogy, are held by educators who are involved with a one to one technology initiative?
3. To what level have educators involved with a one to one technology initiative been exposed to professional development in 21st Century Pedagogy and 21st Century Skills?

Limitations/Delimitations

The limitations and delimitations of this study that have been defined are outlined in this section.

1. The survey used in the study was a self-assessment that each educator completed about his or her perceptions.
2. The data was limited to the honesty of the responses. The study was limited geographically to selected schools within the state of Missouri.

3. Only districts that are involved with a one to one technology initiative were involved in the study.
4. The survey instrument was delivered to the participants through the superintendent in each participating district.

Design Controls

A survey instrument that is valid and reliable was created and piloted prior to introducing the instrument to the sample. In the operational definitions, one to one technology initiative has been defined clearly and concisely to limit error or confusion for the reader.

In determining a population for the study, a population with diverse demographics has been selected.

Definition of Key Terms

One to One Technology Initiative: Instructional approaches that are different in each school but have common features such as providing students with the use of portable laptop computers loaded with contemporary productivity software, enabling students to access the Internet through the school's wireless networks, and a focus on using laptops to help complete academic tasks such as homework assignments, tests, and presentations (Penuel, 2006, p. 332).

Twenty First Century Pedagogy: Strategies and tools that we use to assist with the learning process including differentiated instruction, personalized instruction, project-based learning, concept-based instruction, Socratic instruction, direct instruction, inquiry-based instruction, collaborative learning, and interactive instruction (*Partnership for 21st Century Skills*, 2009).

Twenty First Century Skills: A skill set that should provide the opportunities for students to obtain the skills necessary for them to become successful members of the global job market including creativity and innovation, critical thinking and problem solving, communication and collaboration, information literacy, media literacy, information, communications and technology literacy, flexibility and adaptability, initiative and self-direction, social and cross cultural skills, productivity and accountability, leadership and responsibility (*Partnership for 21st Century Skills*, 2009).

Summary

This study was designed to determine what educator's perceptions are regarding one to one technology based instruction specifically focused on their perceptions about 21st Century Learning and 21st Century Pedagogy. The study was conducted to examine these perceptions and to create a learning tool for public school districts that may be considering such an initiative. With the vast amount of research available that discusses both the positive and negative characteristics of implementing a one to one technology initiative to meet the needs of both 21st century pedagogy and learning, the following chapter will examine a sample of this literature in hopes to fully create a supporting foundation of essential theories, facts, and views for the reader.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

Chapter two will examine both 21st Century Skills and the urgency of educational reform that is focused on preparing students with 21st Century skills. Instructional processes must evolve to meet the evolving global job market. The change in the instructional processes and strategies that have been developed will be discussed as 21st Century Pedagogy in this chapter. This chapter will also discuss the impact that technology integration has had on student learning. The preparation of educators to meet the needs of students based on the changing skill set will be examined as professional development. The researcher will examine the ways that public schools have selected to approach this need and specifically will discuss one to one technology initiatives. This chapter will further discuss the impact that the perceptions of educators may have in implementation of such programs.

The Transformation of Education

While the world makes the transition into the 21st Century, it continues to become more engrained into technology. The society, our current students, and future citizens and leaders are engrained in has also become increasingly complex, diverse and globalized. With this continued progression of societies focus, there must be a change that comes about in how we train and prepare our future citizens and current students. The global job market will require evolved skills in comparison to those of the past. Students must possess greater global competencies; that is students that are able to think critically, communicate effectively, work collaboratively, and be innovative (Wagner, 2008).

Education systems have begun to retool their approach toward preparing students that will have the skills necessary to compete in this increasingly global market. Students in the United States continue to be behind in academic achievement ranking. In the most recent Programme for International Student Assessments (PISA) survey by the Organization for Economic Co-operation and Development (OECD), the U.S. ranked 35th out of 40 countries in math and 29th out of 40 in science, outscored by nations such as Finland, Sweden, South Korea, and the United Kingdom (Darling-Hammond, 2010). To address this showing, the students that we produce will need to have more experience and exposure to 21st Century skills and 21st Century Pedagogy.

Twenty First Century Skills

The U.S. education system is being challenged by the increase in technological advances and the ongoing globalization. Wagner (2008) asserts that in this era of globalization, it is imperative that schools prepare students effectively with the knowledge, dispositions and skills they need to connect, collaborate, and compete in a highly competitive, interconnected world. Students in the United States must become frontrunners in 21st Century Learning. Twenty-First Century students need a deeper understanding of the core concepts in the disciplines; they need to be able to frame, investigate, evaluate, and solve problems using a wide range of information resources and digital tools (Darling-Hammond, 2010). To understand what new skills will be defined as necessary, it is important to examine what skills were the focal point of the 20th Century. Church (2010) provides a 21st Century Educational Paradigm that creates a crossover template between the 20th century educational paradigm and that of the 21st century. The 20th century was teacher focused, supported through a stand and deliver method of

instruction where students were asked to take in content and regurgitate the same content back through lower order of taxonomy assessments and questions. The focus was on content and offered limited opportunities for feedback from the teacher outside of a letter grade on assignments and/or assessments. The 21st century educational paradigm has evolved into a student-focused, collaborative learning environment that has individual learning plans and instruction is focused on processes as well as content. These 21st century classrooms decrease limits on time of learning through opening up links between the students and vast fields of information on the content. Thinking skills have become more higher-order using analyzation, evaluation and creativity to show develop and exhibit knowledge. Methodologies include project and problem based learning and implement a broad use of learning styles such as visual, auditory, kinesthetic and application of multiple intelligences (Church, 2010).

The outcry for 21st century skill has come from many directions. Educators, policy developers, and those involved with economic development have all supported the idea of a need for change in educational efforts. To this fact there are different interpretations of what 21st century skills are specifically defined as, however it has become understood that these skills are accepted as an umbrella terminology that is supported by many organizations. To better understand the specifics of 21st century skills, a framework is provided by the Partnership for 21st Century Skills. The Partnership for 21st Century Skills, nicknamed P21 (Partnership for 21st Century Skills, 2008a) is a national organization that was originally founded and funded by the Bill and Melinda Gates Foundation in 2002. The Bill and Melinda Gates Foundation is one which supports education through the development of collaborative relationships between business,

education, community and government. Twenty six organizations make up P21 with entities including the U.S Department of Education, the National Education Association, Apple, Dell, Microsoft Systems as well as Cisco Systems. With fifteen state departments of education joining in with the 21st century skills movement, P21 has emerged as the leading advocacy organization emphasized on infusing 21st century skills into education for students success in the new global economy (Johnson, 2009).

The Partnership for 21st Century Skills defines five tenants that would work as a framework for student mastery of 21st century skills. These tenants outline a skill set that should provide the opportunities for students to obtain the skills necessary for them to become successful members of the global job market:

1. Twenty-First Century Standards: Design schools to prepare all students with twenty-first century knowledge.
2. Assessment of 21st Century Skills: Provide authentic assessment that is applicable to real world setting.
3. Curriculum and Instruction: Require students to demonstrate achievement of 21st century knowledge and skills-critical thinking, problem solving, communication skills, as well as exhibiting competency on information and technology literacy.
4. Twenty-First Century Professional Development: Organize schools to function as professional learning communities.
5. Learning Environments: Partner with the business community and organizations to help implement the 21st century skills and provide

students with the opportunity to work and learn outside the classrooms
(Partnership for 21st Century Skills 2008b, p. 8).

The Partnership for 21st Century Skills has also created a series of frameworks that describe skills necessary to meet the need of ever evolving global knowledge. Twenty-First Century Student Outcomes outline core subjects and 21st century interdisciplinary themes. Subjects involved with this are: English Language Arts, World Languages, Arts, Mathematics, Economics, Science, Geography, History, and Government and Civics. The organization has also defined five 21st century themes into core subjects:

- Global awareness-learn, respect, and collaborate
- Financial/economic literacy-understand the role of the economy and use entrepreneurial skills to enhance workplace productivity and career option;
- Civic literacy-participate effectively in civic life
- Health literacy-understand preventative physical and mental health measures
- Environmental literacy-demonstrate knowledge of society's impact and take necessary action (Partnership for 21st Century Skills, 2008b p. 2).

The synopsis of this is that the mastery of these core subjects and 21st century themes is crucial for any and all students in the 21st century. To perpetuate the use of knowledge into life skills, P-21 has also identified different categories of skills. These skills define learning and innovations that are thorough identifiers that outline student needed skills such as the ability to think creatively, use information to problem solve both individually as well as in a group. The ability to successfully deal with media by

understanding the means to both procure and decipher said information. The skills also include abilities and/or attributes that a student would need to be a functioning team member on a project such as flexibility, leadership and responsibility (Partnership for 21st Century Skills, 2008b). The skills and/or attributes that are defined as 21st Century Skills vary in focus but all are part of the encompassing focus on creating deeper knowledge with abilities for application of this knowledge through various skills and tools. The following text will include a discussion of the proficiencies that are focused on under the umbrella of 21st century skills. The following paragraphs will also provide an understanding of the groupings, sets, skills and how each impacts the education of today's learners.

Creativity and Innovation

The Arts Education Partnership provides data representing the efforts of several individual states, supports the idea that to produce competitive workers, there must be a focus on creating skilled, versatile and highly adaptable workers who have the capacity for creativity and innovation (Ruppert, 2010) States including Massachusetts, Wisconsin, North Carolina, Ohio and West Virginia have each shown commitment to educational reform that includes a strong focus on the development of creativity and innovation in students (Ruppert, 2010). Thinking creatively includes brainstorming and creating new and valid ideas. Creativity is the process of being able to develop ideas, while innovation relates to the ability to put those ideas to use (*Partnership for 21st Century Skills*, 2009). These two processes are interrelated. Creativity is the energy which innovation uses to complete the task. For students to be prepared to function in the job market that is evolving, they must be able to develop their own unique ideas and use them to design,

develop, or discover new ideas, processes or solutions to problems. Creativity and innovation are the stepping stones to the next set of skills, which is putting thought into actions to solve problems.

Critical Thinking and Problem Solving

Students must also grow into citizens who can apply knowledge to real world situations. “Developing students who are independent enough to think critically about academic subject matter and real-life problems is an educational objective of paramount importance to our educational system as well as greater society” (Tsui, 2002, p. 185). Tsui stated that to safeguard a democratic society with an able thinking citizenry and ensure a competent workforce it is essential to foster critical thinking skills.

Problem solving and critical thinking outline student’s ability to be able to take knowledge, facts, and data and effectively solve problems. This does not mean there is a need to have an immediate answer, it means there is the need to be able to think quickly, evaluate problems and processes and find solutions. The ability to develop a well thought out solution within a reasonable time frame, however, is a skill that employers in a global job market will value greatly. Abrami, as stated in Notar and Padgett 2010, reports that Critical thinking and problem solving skills create abilities in students to approach things from a new perspective and have a willingness to look at tasks openly. These skills also enable learners to focus on the value of finding new ideas, listen to others, and support others when they come up with new ideas (Notar & Padgett, 2010). The skills of listening to others and supporting the thoughts and ideas of others overlap into another description of 21st century skills as well.

Communication and Collaboration

The nature of collaboration is shifting to a more sophisticated skill-set (Dede, 2009). Outside of face to face collaboration, workers in the 21st century must be able to meet goals and accomplish tasks with colleagues halfway across the globe. Collaboration must be included in 21st century skills due to the importance and value of cooperative efforts and interpersonal capabilities. The skills are more involved and more complex than needed in previous eras (Dede, 2009). Not only is it key for learners to be able to know and understand a concept, but more importantly, they must be able to clearly share that understanding or knowledge with others. They must be able to share that information in groups, either large or small, as they work together to solve problems or work toward a common goal (*Partnership for 21st Century Skills*, 2009).

Information Literacy

As important as the skills of communication and collaboration are to the learning process, learners must also be educated to and able to effectively evaluate the information that is brought to the table during a collaborative process. The 21st century has been nicknamed the Information Age due to the explosion of information and the resources that provide information. With this massive influx of information that is right at everyone's fingertips, learners must be able to develop skills that will allow them to discriminate between quality sources and poor or unreliable sources as well as determine the reliability of the information (*Partnership for 21st Century Skills*, 2009). A study group for the National Forum on Information Literacy defines information literacy as the ability to access, evaluate, and use information from a variety of sources (Lee & So, 2014) The value of information literacy has been both studied and promoted by

organizations. Documents in the Web of Science show that an increased amount of research has been compiled on information literacy over the past several years (Lee & So, 2014). Information literacy equips them with the critical skills necessary to become independent lifelong learners. Information comes at learners from vast sources. To build upon learners abilities to evaluate the information, they must next learn to understand the structure and purpose of information and media.

Media Literacy

Media literacy has a long-standing history that has seen a span of great growth over the past two decades (Lee & So, 2014). There are new technologies that have changed the way that people receive and share information. Media literacy has been described as the ability to access, analyze, evaluate and communicate messages. It has become an integral part of the 21st Century (Thoman, 2003). The embedding of technology into education brings about an important area for students. Students involved in a one to one initiative interact with media through different outlets, different perspectives, and different approaches continuously (*Partnership for 21st Century Skills*, 2009). To be able to pull the valid information that is contained from this media, they must have an understanding of how these media messages are constructed and be able to determine the purpose of each piece of media. This is also a knowledge base for creating media. The students must understand that people interpret messages differently, and how the information that they choose to create can have an influence on beliefs and behaviors. With this understanding students can then focus on the information at hand.

Information, Communication, and Technology Literacy

Personal computers, smart phones, wireless internet, tablets and other various forms of technology have made a major impact on our personal and professional worlds (Safar & AlKhezzi, n.d.) A survey that was created and implemented in a private institution in the Northeast region of the United States focused on the impact of information, communication and technology literacy. That study results indicated that information, communication and technology literacy helped in raising student test scores on standardized testing, increasing student's collaboration and communication skills and raised student motivation and engagement in their own learning and growth (Sandler, 2010, as presented in Safar, AlKhezzi,) Information literacy is concerned with a student's ability to collect, analyze and utilize information gathered via the use of information technology and to use that information to make effective decisions (Hignite, Margavio, & Margavio, 2009). As technology grows and becomes ever more available to learners, it becomes necessary for students to be fluent in both software and hardware. Students need to both be able to maneuver and manipulate software and programs effectively but also need to be readily able to put hardware to use to create or communicate information. These factors would seem to be equally important for students to be able to create products or artifacts to show knowledge and understanding of concepts.

Flexibility and Adaptability

The question of whether or not a person is adaptable and whether a person is able to adjust to new and changing situations is more and more important in our rapidly evolving private and professional world (Hamtiaux & Houssemand, 2012). Classrooms that are structured on project based learning or collaborative efforts of students will focus

on the ability of students to adapt in a learning situation to varied roles and responsibilities. With the increased occurrences of projects and situations where students must work together on activities, learners must be able to be open to changing roles to best approach situations. Though these projects are group or team oriented, they also provide opportunities for individual attributes such as drive and focus, to be exhibited.

Initiative and Self -Directive

The capacity for self-direction is the foundation for learning (Martinez & McGrath, 2012). Educators must work to create learners who develop into self-directed learners so they will be ready for the job market post-graduation. To be successful in today's global markets, companies need employees who actively attack problems, search for new opportunities, and continuously improve their work environment (Bledow & Frese, 2009) Employers need to have a thought driven work force. A benefit for any employer would be to build a project team that would continue to move themselves as well as the team forward without needing the push of a leader. Students must go through learning activities in school that will define an objective and then be given an open road map of how to meet that objective. This will identify and possibly foster the skill or trait of taking initiative in the learning process as well as develop leadership skills and communication between those working in the group.

Social and Cross-Cultural Skills

Student's abilities to work in a diverse community are also important.

“There are skills that are essential for social and emotional learning that include the ability to communicate effectively, social skills that allow for true participation and cooperative works in groups, emotional self-control and

appropriate expression of emotions, empathy and perspective taking, the ability to plan, set goals focus concentration and energies, follow through, problem solving skills and the ability to resolve conflicts thoughtfully and nonviolently, and the skills and dispositions needed to bring a reflective, learning to learn approach to all aspects of daily life”(Nolan, 2003, p. 10).

An essential element to being a part of any group is the skill of knowing how to work as a functioning, contributing member of the team. Learners must develop skills that guide them in knowing when to listen and when to speak. In preparation to enter a global job market, learners must develop an understanding and respect for the different perspectives, backgrounds, cultures, values and beliefs that will be present in an eclectic learning environment. Students need to obtain the skills that allow them to work with others to reach a common goal while coming from different perspectives and/or belief and values (*Partnership for 21st Century Skills*, 2009). Students or learners need to obtain the ability to not only work toward a common goal but also become dependable to manage their selves to provide quality outcomes even when met with obstacles.

Productivity and Accountability

Productivity and Accountability, regarding 21st Century Skills, has been defined as the ability to set and meet goals, even in the face of obstacles and competing pressures and demonstrate additional attributes associated with producing high quality product such as time management and multi-tasking (*Partnership for 21st Century Skills*, 2009). Work forces are using more and more team-oriented approaches. Employers need those who are both goal oriented and disciplined to work through issues until the project is successfully completed. 21st Century learners must become learners that are fluent in their ability to

work through and solve complex problems or issues if they are to be adequately prepared for the global work force.

Leadership and Responsibility

With the evolving work force that is creating more team-like structure to manage projects, it sets up the need and opportunity for persons who have innate abilities to move a group of people toward a common goal to set themselves apart. Those individuals who have these abilities have the knowledge and instinct to use their interpersonal and problem solving skills to influence and guide others toward a common goal. These skills are the common thread of many definitions of 21st century skills. These skills provide the skill set that will be focused on in this study.

As a follow up to ensure student mastery of the 21st century skills, P21 has also developed a support system for 21st century skills that is made up of the following: standards(a focus on the skills of the 21st century), assessments(balanced, high quality standardized assessments with efficient and effective formative as well as summative assessments, useful feedback, and student portfolio production), professional development (both the tools and teaching strategies, project-oriented teaching methods, and professional learning communities), and learning environments(sharing the best practices, supporting professional learning communities, real world 21st century contexts, and provide architectural and interior designs for group, team, and individual learning) (Cho, 2012).

The core competencies of 21st century skills are intertwined into the teaching that takes place in core academic subjects. The framework for 21st century skills that is presented by P21 defines teaching and learning that has a direct focus on outcomes for

students based on specific skills and content knowledge (Partnership for 21st Century Skills, 2009). Supports systems are also set to foster student success in learning essential 21st century skills.

In summary, the Partnership for 21st Century Skills framework develops both curriculum and instructional strategies that represent the five interdisciplinary themes. Standards including both formative and summative assessments are in place as support systems that are designed to ensure student success. Professional learning communities that are based upon collaborative practices among teachers are in place and the professional development is prioritized to improve teacher's abilities to meet the needs of students learning of these crucial 21st century skills.

Pedagogy for Learning in the 21st Century

To support the change of our student's skills in the public education system to meet the evolving needs of a global job market, schools are changing the processes of providing instruction to meet the changing ways students learn. The process of learning refers to tools that we use to enable the learning process. This includes pedagogical strategies and tools that we use to assist with the learning process, such as textbooks, computers, and other media (Hill & Reeves, 2004). Educators have known for some time that a one-size fits all approach to learning does not lead to the level of student engagement and academic success that schools strive to achieve. In their search for a more customized approach to delivering instruction, educators have explored project-based learning, addressed different learning styles, and increased collaborative learning among students (Demski, 2012). Technology has also been researched and experimented with to create individual learning experiences that meet the needs of individual students.

To branch away from the traditional, industrial revolution style educational process, educators and schools have been searching for a way to develop personalized learning scenarios for individual students. Personalized learning is a student-centered teaching and learning model that acknowledges and accommodates the range of abilities, prior experiences, needs and interests of each student-with the goal of moving every student to a higher standard of achievement (Demski, 2012,). While this search has been ongoing for several years, the opportunity and focus on attaching this search to technology is a newer trend. This trend has increased as an area of emphasis due to technology becoming more and more available to make such a movement. Personalized learning is supported in the National Technology Plan which was developed by the U.S. Department of Education's Office of Educational Technology (2012). The plan describes personalized learning as an instructional approach that encompasses both differentiation and individualization, but is also flexible in content or theme to match the specific interests or prior experiences of learners (Demski, 2012). The following paragraphs will provide a deeper look at the major components of 21st century pedagogy. The different approaches of instruction will be discussed as well as provide a brief understanding of what the approach will look like for today's learners.

Differentiated Instruction

Differentiated instruction is regarded as an effective teaching tool to meet the diverse academic needs of learners (Anderson, 2007). Differentiated instruction is based on the facts that not two students are the same and therefore they should each be provided with chances to conceptualize and make sense of ideas. The focus is on the student and what the student needs to be successful and also what the student brings to the learning

opportunity. Carol Tomlinson, who is an expert on differentiation states that differentiation is based on the beliefs that: students who are at the same age differ in their readiness to learn, these differences are significant enough to make a major impact on student learning, students will learn best they make a connection between curriculum and their experiences and interests (Tomlinson, 2000b).

While the term differentiated instruction is not a new term in education, the purpose and power of this style of instruction has been greatly rejuvenated with the infusion of one to one technology initiatives and the 21st century pedagogical approach that has grown with it. Differentiated instruction describes the process of making sure each student or learner has an understanding of the concept at hand. It aligns learning with individual student readiness and works to connect the instructional style with the learning style that best fits the student. One to one initiatives implement technology to create this individual track that makes differentiated instruction a more realistic and available mode for teaching and learning.

Personalized Instruction

Twenty-first century pedagogy is focused on creating optimal learning experiences for all learners. It pulls from past experiences for each learner and attaches next stage learning or objectives to that existing knowledge base. In a classroom that implements 21st century pedagogy to adequately prepare students for the global job market you will see instruction where teachers help students develop personal learning plans. These plans identify their cognitive strengths and weaknesses, identify their learning styles, as well as help adapt the learning environment and instruction to learner needs and interests. The goal of this approach is to develop a real and personal learning

experience that will develop a connection between the student or learner, and the content. This connection is meant to be the difference in learning a concept and developing an understanding and respect for the concept (Demski, 2012).

Project Based Learning

To meet the changing need of students, instruction that is designed to make learners complete complex tasks based on challenging questions or problems are being infused into the learning process. These projects design opportunities for students to implement problem solving as well as investigative skills. In this process the teacher acts as a facilitator and provides opportunities for reflection for the students. Workplace organizations are providing project based learning opportunities for employees. The projects are based upon “everyday” learning and are implemented to guide or foster employee learning to improve the business or organization (Poell & Van Der Krogt, 2003). To develop work ready students, such programs or projects must reside in education of today’s student.

Concept-Based Instruction

Concept based instruction organizes various units of study to help children integrate new information in such a manner that they are able to see and identify a number of patterns, situations or even connections between facts and concepts or ideas (*Partnership for 21st Century Skills*, 2009). Research has stated only the high achieving students ever arrive at full understanding of concepts of the content presented in textbooks. Due to this gap, the concept based instructional model has been developed to accommodate students with learning needs and is based on the following components; teachers must determine the concept that is the target of instruction, graphic organizers

are used to outline the concept, student success of mastering the concept is measured by them putting the concept to use in instances of complex and critical thinking (McCoy & Ketterlin-Geller, 2004, p. 89)

Socratic Instruction

Socratic instruction relates back to the Greek philosopher, Socrates, it is based upon asking or proposing questions that require students to search for general, common or basic truths. This style of instruction pushes learners to find these points of information and then evaluate them to determine their belief and their thoughts about these concepts (*Partnership for 21st Century Skills*, 2009). “Recommendations for the improvement of instruction have been directed at innovative teaching methodologies such as Socratic questioning and computer based instruction” (Watters, 2000, p. 263). With this continued focus on improvement from a lecture only classroom setting, the use of Socratic instruction is making its way beyond the university law classes and into public middle and high schools. Socratic instruction aligns with the focus on deeper depths of knowledge and content mastery verses content memory.

Within the history of curriculum development, in the context of an emerging global economy and the needs of the resulting workplace, existing schools of thought about the desired curriculum have been tailored to fit the new constructs of the 21st century workplace and the global society in which children will live (Ford-Marsh, 2012). The changing curriculum however will not suffice in the development of 21st century skill prepared students. For the students to engage their thinking in new and deeper ways, instructional practices must also evolve so that the process brings about and facilitates more in depth thought and understanding. The more real the experiences are, the better

for the learner (Lemke & Coughlin, 2009). There is better understanding of content and curriculum when the subject matter is related to an area of interest, personal experience or real world context. Students now require the skills that allow them to collect, analyze, and disseminate information to problem solve. Traditional lecture and regurgitation no longer fully meets the needs that students in a global, informational age require. Change has been made in the United States. The majority of states have now acknowledged allegiance to the Common Core. Common Core has standards that support the skills of analyzing, collecting, and disseminating information that are essential 21st century skills. The Common Core emphasizes cognitive development through reading and math, as evidenced by the following standards that are outlined for Mathematics and English/Language Arts (Conley, 2011). The Common Core standards for mathematics support skills that develop student's abilities to understand and solve problems, use abstract reasoning and create student knowledge to analyze, research, reason and discover regularity and structure. The culmination of these skills is for a deeper understanding of mathematics concepts. In English/Language Arts the emphasis of learning lies on the increased level of text difficulty and use of text.

Change in standards to the Common Core is a step toward bringing public education up to speed in meeting needs of learners to prepare them to be competitive citizens in the economy and market of today. The standards support the skills that are outlined in the multiple descriptions of 21st century skills as well as support the need of technology to fully meet the student's needs. Technology is a tool that will allow for the curriculum to become a better combination of process and content. This opens the door for more personalized learning, attaching learning to personal experiences of individual

students, and the evolution of the public education system and meeting global learning needs of students.

Education has transitioned through the years but has done so at a pace that is slower than other entities. Technology is a tool that will lift limits and expand possible learning boundaries for education. Technology allows for the resources of a student in a rural setting to have the same access to information as someone in a prominent suburban system.

Role of Technology to Support 21st Century Skills and 21st Century Pedagogy

Technology can be put to use in a wide variety of ways. Using knowledge and information to make decisions, communicate and process information are examples of such needs. Educators have a responsibility to discover the most innovative and useful ways to implement technology into the classroom to meet 21st century needs.

Instructional technology is evolving daily as the ongoing evolution of student needs is evolving. Utilizing technology tools in the classroom can have a tremendous impact on learning. “Technology opens so many doors. It enables them [students] to continue to learn and seek out answers and ask the questions that can lead to new places” (Grove, 2007, p. 17). In addition, technology increases student participation in more interesting and sophisticated ways (Ullman, 2007).

Technology immersion of a classroom also changes the role of the teacher in the classroom. Teaching in a technology rich classroom will transition the teacher into a role that is more of a learning facilitator. Environments which resemble a constructivist learning environment where learners explore, work with others, investigate and build their knowledge are learning environments that are desired (Sprengr, 2010). As a

facilitator, the goal of the teacher is to involve students in real-world-related learning activities that deal with multiple perspectives, are student-directed, deal with constructing knowledge rather than repeating it, build on what the student already knows, involve problem solving, and use primary sources of data (Pritchard, 2007). The Internet opens passages to multiple lines of information that allows students to find different perspectives on data and not be limited by the date and perspective provided by a traditional textbook resource.

To support this change in instructional strategies and pedagogy, schools have begun to implement one to one initiatives or ubiquitous computing programs. While each individual program has different goals, generally, these programs are designed to promote an increased level of academic achievement. The quality of instruction is transformed as well as the type of learning taking place fostering the opportunity to develop a higher level of student engagement. The classrooms in such programs evolve from a teacher centered environment where the instructor doles out information to an environment where the instructor facilitates not only learning but the students now are the center of the environment and are more actively engaged in the learning. The technology allows the students to create and work on learning projects which are individualized or are parts of collaborative team work focusing on higher order thinking skills. Technology infused instruction also works well to provide equitable access to information for all students or learners. No longer should socioeconomic status or a regional location, inhibit the learner's ability to access information. With every student equipped with a laptop there is equal access available to students. Preparation for a global economy requires that students be prepared for skills and work that will be infused with technology. The

implementation of technology into education is a step in preparing students to thrive in work environments later in life that require skills such as information gathering and dissemination, communication and analytic problem solving. The exposure to technology puts students into touch with the multimedia resources that are essential in building such skills. (*One to One Computing in Public Schools: Lessons from Laptops for All Programs*, 2008).

Student Learning in the 21st Century

The implementation of one to one technology initiatives have goals of increasing student learning and providing 21st century skills to the students. In reviewing the implementation of one to one technology initiatives it is crucial to delve into the foundational goal of improving student learning. Need for educational reform is required to meet the needs of a more global job market that requires student skills different that those in the past. Much research has been done on the impact of one to one technology initiatives on student learning as represented by student achievement. Demski (2012) stated that “by marrying the principles of personalized learning with the tools of technology, some educators believe that they have a chance to create the kind of customized learning environment that can finally break schools out of the industrial-age model of education to bring about true 21st century school reform”(p. 33). Though mixed results have been reported, there is substantial data that supports increased student achievement through the implementation of a one to one technology initiative. Holcomb (2009) analyzed the results of several one-to-one laptop initiatives across the United States and came to the conclusion that “students in one to one programs earned significantly higher test scores and grades in writing, English-language arts and overall

grade point averages than students in non-one to one programs” (Holcomb, 2009, p. 53)

The largest study that has taken place on one to one laptop programs took place in Maine and included 16,000 students (Silvernail & Gritter, 2007), revealing the potential impact of such a program. The state of Maine began its one to one program in 2000 and during that year’s assessments, 29.1 percent of their eighth grade students met the Maine Educational Assessment (MEA) writing proficiency standard. In 2005, after five years of the program, 41.4 percent met this standard. The data shows considerable growth in writing proficiency however the more powerful data came in revealing the importance of the ways that the laptops were used in teaching (*One to One Computers in School: 2010 Literature Review*, 2010). A group of students, who had learned how to draft, edit and produce a final copy of any writing, were compared to a group of students who had never used a laptop for writing. The average student of the students who had been instructed in using a laptop to write outperformed 75 percent of those who had not used a laptop for writing. (*One to One Computers in School: 2010 Literature Review*, 2010).

The Berkshire Wireless Learning Initiative (BWLI) was a pilot program that provided one to one technology access to all students and teachers across five public and private middle schools in western Massachusetts (Bebell & Kay, 2010). A study conducted on student achievement on this learning initiative showed again that after three years of one to one implementation there was evidence that student achievement had been positively enhanced through the types of educational access and opportunities afforded by the one to one pilot program (Bebell & Kay, 2010). This study supported how one to one laptop initiatives can have a profound effect on student learning and student achievement. To meet the need of 21st century skills for students and or

technology to have its most effective impact, educators have developed an understanding that technical innovations are vital tools for improving student learning.

In a study conducted by Bebell and Kay(2010), it was found that teaching and learning practices changed when students and teachers were provided with laptops, wireless learning environment, and additional technology resources as cited in (Bebell & O'Dwyer, 2010). Changes in student learning, while evidenced by student achievement scores, cannot make the transition to 21st century learning skills without a change in the traditional classroom setting. When reviewing the laptop initiatives by using the Framework for 21st Century Learning from the Partnership for 21st Century Skills, (Corn, Tagsold, & Patel, 2011) you can begin to see the impact of technology on student learning. Twenty first century learning is based on student outcomes, life and career skills, learning and innovation skills, and information, media and technology skills supported by systems such as learning environments, professional development, and curriculum design (*Partnership for 21st Century Skills*, 2009). This is bringing about more authentic learning for students. Students reported that they learned a great deal from authentic activities such as mini-research projects, storyboarding, creating PowerPoint presentations, study guide websites and podcasts, editing digital photographs and video, playing games for review, and writing articles in Microsoft Word (Corn et al., 2011).

Role of Professional Development in 21st Century Pedagogy and 21st Century Skills

The ongoing growth and development of people in the teaching profession shows a common core value among educators. Professional development is actually more appropriately defined as professional growth. This professional growth or development

mirrors an educational focus on creating lifelong learners, which is a part of many school mission and vision statements.

The motivation to learn can be both intrinsic and extrinsic. Sometimes educators are driven by a need that has arisen at school and they then have a reason or task that is attached to their attempt at growth. Other times personal issues or interests can create an individual's desire to acquire new knowledge or experiences. In the case of professional development at school, it is generally driven by a common goal or purpose that the school has accepted. This purpose is then promoted as the next tool or focus used to improve student learning opportunities by further educating staff. The reason for this is due to the fact that in traditional settings, the level of instruction that a student could receive was based entirely on the knowledge level of the teacher or the text or resource that the teacher had access to. The evolution of technology integrated education has taken the limitations off of the teacher and the text and opened up vast avenues of resources for students. Professional development for teachers and educators must work to continually develop and grow teacher's abilities and experiences so that student learning opportunities can be optimized.

Providing access to technology is one move towards creating a personalized learning environment that meets 21st century skills but it is not enough on its own. Teachers need to be provided the professional development opportunities and experiences that not only allow them competence and confidence with technology, but that also can create a level of enjoyment or interest in technology and its potential. This could generate an energy and environment that will foster the use of technology and its potential and ability to drive 21st century learning. Professional development for the 21st

century should be a part of a comprehensive emphasis on 21st century skills that includes updates to standards and assessments. Successful 21st century professional development programs are programs that work to make certain that educators fully understand the value and necessity of 21st century skills and they understand and are taught how to integrate these skills into the instructional program in their schools. To model the collaborative processes students will be going through to develop these skills, teachers and instructors must be involved in collaborative professional development programs that support collaboration among all of the participants of the professional development program. Teachers and administrators should be encouraged and allowed to construct their own learning communities. This will open the opportunity to pull from the expertise that already exists within the school through coaching, mentoring and collaborative team teaching exercises. The program must also support teachers and instructors as they make the progression to facilitators of learning and must use and model 21st century tools that teachers will be using in their classrooms (*Partnership for 21st Century Skills*, 2008b).

Staff development must be centered on improving teacher knowledge on 21st Century Pedagogy and Skills. “Effective staff development focuses on the knowledge, skills and attitudes required of teachers, administrators, and other school employees so all students can learn and perform at high levels. Staff development not only includes high-quality, ongoing training programs with intensive follow-up and support but also other growth-promoting processes such as study groups, action research, and peer coaching, to name a few”(Gateway, 2005, p. 22). As access to technology has increased, the professional development opportunities that will enable teachers to become proficient in technology must be made available. For teachers to become efficient learning facilitators

who lead students to understanding and mastery of 21st century learning skills, they must first be made not only comfortable but knowledgeable in the use of technology. The success of a one to one initiative can hinge on the ability and comfort levels of teachers to effectively integrate laptops into learning. Teachers, who do not have confidence in their technology skills, commonly fail to utilize laptops (Hu, 2007). Teachers must have the ability to adjust and rethink their instructional approaches so that they can successfully implement technology initiatives that are focused on meeting 21st century skill needs. To meet this need appropriate professional development must become an intertwined component of any initiative that embeds technology as a tool for learning.

Professional development that is ongoing, and that is engrained in teaching and learning as well as technology usage must be present. The skills of using technology alone will not support the focus of a one to one technology initiative. The National Educational Technology Standards for Teachers (NETS-T) stated that teachers should not only use their knowledge of subject matter and teaching but also technology to facilitate experiences that advance student learning (*International Society for Technology in Education*, 2008). Professional development programs which supply educators with knowledge and skills must also strive to create a feeling of confidence in educators to use the technology to improve student learning opportunities. Educating staff members in all facets of student learning through technology initiatives will support this needed level of comfort while also developing a positive perception about technology itself. The perceptions that educators hold in regard to technology itself could impact the use of, and effectiveness of use of, technology in a one to one technology initiative.

Perceptions of Educators in Regard to Technology Initiatives

The success of a one to one technology initiative is dependent on many factors. According to Li (2007) one of these factors is dependent on the technology-enhanced environment that can “force teachers to change their role from knowledge dispensers to facilitators” (p.379). This pulls teachers away from their comfort zone of traditional methods of teaching. In a recent study, students revealed that technology “enabled diverse approaches in teaching and learning, sometimes in ways that could not be achieved by the traditional-textbook methods” (Li, 2007, p. 383). The need for understanding technology integration is growing. Many educators become resistant to using computer technology in the classroom with their students because they feel uncomfortable with their personal level of technology ability (Ullman, 2007). The ability to influence the teacher’s abilities and comfort level with technology relies on the professional development that educators involved with a technology initiative are provided. Teachers must be educated in the use of technology as both an instructional tool and professional tool and be prepared to use it in the classroom (Park & Ertmer, 2007). The number of computers and level of training in information technology might also be predictors of positive teacher attitude toward instructional technology (Shaunessy, 2007). Understanding the relationship between perceived benefits of instructional technology and student proficiency levels is among the critical elements that educational leaders, administrators, and trainers, must consider in the development and support of effective technology integration strategies (Woolridge, 2009).

Educators cannot manage, let alone effectively lead, a learning environment focused on 21st century skills without having a legitimate set of personal technology

skills. Those being, knowledge of what tools are available, the abilities of those tools and what they could mean to their classroom. Educators must transition to thinking about technology as a verb and not a noun (Ford Marsh, 2012). A sound understanding of the use of the tools is where the value of the technology lies. Educators must be exposed to professional learning in software, device usage and device management as well as 21st century tools. They must also expand their own skills and knowledge of 21st century technology by creating authentic projects for their students (Ford Marsh, 2012). This will allow for students and teachers to learn together in a horizontal learning environment while providing relevant applications for the theories and concepts of the course (Ford Marsh, 2012). The expansion of skills and abilities in educators may be fostered through a professional development program that creates opportunities for growth of educator's abilities in technology.

The development of skills and knowledge of educators who are involved with one to one technology initiatives is an effort to positively influence the perceptions, values and beliefs of such educators. The perceptions of the educators using this pedagogical approach could be a vital key to the success of students within the programs, therefore justifying the study of these educators perception regarding 21st Century Skills and 21st Century Pedagogy.

CHAPTER THREE

METHODOLOGY

Introduction

Students are growing up in a world where common modes of self-expression come from mobile computers, cell phones, social networking, instant messaging, blogs, wikis, and text messaging. Educational technologies have been shown to enrich learning environments and enhance student's conceptual understanding (Greenhow, 2008, p. 16). With schools making the recognition of this change the schools must also recognize the changing role of the teachers. School districts are implementing the tenets of a one to one computing initiative to meet the changing needs of students. One factor that could impact the success of such a program is teacher perceptions in regard to a one to one technology initiative. The success of a one to one initiative can hinge on the ability and comfort levels of teachers to effectively integrate laptops into learning (Holcomb, 2009). This study is designed to examine teacher's perceptions in districts that are involved with a one to one technology initiative and to answer the following research questions:

1. What perceptions, in regard to 21st Century Skills, are held by educators who are involved with a one to one technology initiative?
2. What perceptions, in regard to 21st Century Pedagogy, are held by educators who are involved with a one to one technology initiative?
3. To what level have educators involved with a one to one technology initiative been exposed to professional development in 21st Century Pedagogy and 21st Century Skills?

A survey (see Appendix A) has been created that was administered to the educators from the selected school districts who are involved with a one to one technology initiative to collect data for this study.

Population and Sample

Participants of this study were determined by selecting teachers and administrators from school districts in Missouri that have implemented a one to one technology initiative. Districts were included that are in all stages of implementation including providing professional development for teachers prior to implementing with students, districts piloting programs with selected groups of students, and districts that are at full implementation with students receiving instruction through the one to one format. Teachers and administrators in any grade level involved with a one to one technology initiative will be included in the study. School districts selected from Missouri that have been identified as having a one to one initiative will be included to develop a pool of participants. Tackett (2014) defines one to one technology in her previous study as any school in which each student and teacher has an internet-connected wireless computing device for use both in the classroom and at home, 24 hours a day, seven days a week, in any district building or grade level. According to this definition, there are over 60 districts in the state of Missouri that have a one to one technology initiative in place (Tackett, 2014). These districts have been selected based on their involvement in implementing a one to one technology initiative as defined in chapter one of this study. The teachers and administrators of these 60 districts will make up the population of the study with a stratified sample being selected to take part in the study.

Participants will be given an informed consent document and will be asked to take part in an online survey as the data collection piece of the study. The study was designed to use a Likert Scale response system. Selected educators will respond to series of questions that focus on their perceptions about 21st Century Skills and 21st Century Pedagogy as well as exhibit their exposure to professional development about one to one technology initiatives.

Sampling Procedures

A stratified sample of participants was selected for the study. These school districts were selected for this study because the district leaders have affirmed their district's participation in one to one technology initiatives through response to a previous survey (Tackett, 2014). This sample of Missouri school districts provided data that represented perceptions of educators at various stages of implementation of a one to one technology initiative as discussed in the research questions in this study.

Pilot Process

In an effort to maximize the reliability of the survey, a number of the questions were reverse coded prompting the reader to read and respond accurately to the specific items. During the development of the survey, the instrument was reviewed and amended based upon feedback from the researcher's committee. After several changes the survey was then presented to three administrators and two teachers who took the survey in the presence of the researcher. Observing the volunteers taking part in the survey allowed the researcher to have dialogue with the participants and gain understanding of any issues found by the pilot participants. A five-member panel of experts was selected to review both the survey tool format and the effectiveness of the survey. This panel included three

university level educators, as well one building principal and a district superintendent. The survey was sent to the panel of experts and they were asked to complete the survey and provide feedback. In an effort to support the content validity of the survey tool, the researcher used the process developed by Rovinelli and Hambleton's index of item-objective congruency (Rovinelli & Hambleton, 1977). Using a scale of -1, 0, and 1, the -1 indicates the question has no relation to what it is intended to ask, 0 is neutral, and 1 signifies the question asks what it is intended to ask. Based on the feedback received through the expert pilot process, one question on the survey was removed due to receiving a score of .28, which was well below the cut desired cut score of a minimum of .6. The table below displays the results of the index of item-objective congruency.

Table 1: Index of Item-Objective Congruency

Survey Statements	Index
Student learning can increase through curriculum that is attached to student's personal interests.	1
Learning activities should be designed to develop reasoning and decision making skills.	1
I believe that student learning can increase through personalized instruction.	1
The ability to research and find support for points of view is an important skill.	1
Students should be given activities that allow for independent direction of study on concepts.	1
Students need to be able to understand connections among systems to develop solutions to complex problems.	.80
Activities that are authentic to the student foster greater learning.	.80
Students need to be able to ask significant questions toward solving complex problems.	1
Instruction should be customized by teachers based on individual learner needs.	1
Students need to be able to create and evaluate information successfully.	.80
Instruction should be developed to connect to student interests.	.80
Learning activities should be focused on developing students ability to use sound reasoning in decision making.	1
Personal learning plans allow students to identify strengths and weaknesses.	.80
I believe student learning can increase through differentiated instruction.	1
Students need to be able to apply content to authentic, real world problems.	1
Students must be able to analyze information to create solutions to complex problems.	1
Instruction should be customized by teachers based on individual learner needs.	1
Identifying individual students preferred way of learning promotes individual student growth.	.80
Learners must be able to discover connections among systems to develop solutions to complex problems.	1
Skills that allow students to be able to evaluate information are focused on in my school.	.28

The pilot survey was then distributed to a public school district in Missouri that had 101 certified staff members who are involved with a one to one technology initiative. The pilot survey was presented to the participants via email that included a link to the survey. The results of the pilot survey were reviewed with two of the researcher's committee members. The pilot survey results were uploaded to the Statistical Package for Social Sciences (SPSS) to perform a factor analysis to determine validity. Questions from

the survey were assessed by using load values of $< -.300$ or $> .300$ as a baseline score. These scores were used to assist in determining the construct validity of the questions on the survey. Questions were assessed using the values and revisions were made. During the factor analysis of the pilot survey results, many questions expressed values indicating the question was influenced or connected to each of the two scales. Wording changes were made to those questions that expressed such values prior to the final survey being sent out to participants. The two scales of the survey are 21st Century Skills and 21st Century Pedagogy. Table 2 below represents the factor analysis performed to determine question loading per scale. Questions that did not load to the scale that they were designed for were reworded to align to the correct scale. During this process there were three questions that were reworded to more closely align to the correct scale and one question was eliminated entirely from the survey due to responses on the pilot.

Table 2: Exploratory Factor Analysis

	Scale	
	Skills	Pedagogy
Student learning can increase through curriculum that is attached to student's personal interests.	.598	.778
Learning activities should be designed to develop reasoning and decision making skills.	.573	.808
I believe that student learning can increase through personalized instruction.	.576	.801
The ability to research and find support for points of view is an important skill.	.547	.810
Students should be given activities that allow for independent direction of study on concepts.	.437	.846
Students need to be able to understand connections among systems to develop solutions to complex problems.	.715	.608
Activities that are authentic to the student foster greater learning.	.782	.586
Students need to be able to ask significant questions toward solving complex problems.	.805	.569
Instruction should be customized by teachers based on individual learner needs.	.796	.427
Students need to be able to create and evaluate information successfully.	.791	.588
Instruction should be developed to connect to student interests.	.747	.487
Learning activities should be focused on developing students ability to use sound reasoning in decision making.	.779	.544
Personal learning plans allow students to identify strengths and weaknesses.	.808	.528
I believe student learning can increase through differentiated instruction.	.770	.445
Students need to be able to apply content to authentic, real world problems.	.779	.591
Students must be able to analyze information to create solutions to complex problems.	.787	.593
Instruction should be customized by teachers based on individual learner needs.	.795	.526
Identifying individual students preferred way of learning promotes individual student growth.	.785	.505
Learners need to be able to discover connections among systems to develop solutions to complex problems.	.543	.813
Principal Components Factor Analysis with Varimax Rotation		

The final step of the pilot process was to run the Cronbach's Alpha through SPSS using the pilot which had 45 responses and two scales. Cronbach's alpha for the scale of 21st Century Pedagogy consisted of 9 items ($a = .98$). The second scale of 21st Century Skills consisted of 10 items ($a = .99$) also easily meeting the goal of a .70 or higher. Both of these scales score high enough to be used in the final survey.

Data Collection and Instrumentation

The study was a quantitative study that examined the perceptions of teachers and administrators involved in implementing a one to one technology initiative. The study was designed as Descriptive Research based upon the use of an instrument that was a questionnaire to gather information from groups of subjects (Ary, Cheser Jacobs, Razavieh, & Sorensen, 2006). The study specifically focused on the educator's perceptions regarding 21st Century Skills as well as 21st Century Pedagogy. An online survey was created (see Appendix C) that provided confidentiality for all who took part in the study. The online survey was administered through QuestionPro to allow ease for all those invited to take part in the study. The teachers and administrators within the building of the selected districts who have been directly involved with the one to one technology initiative were invited to participate in the survey. The survey focused on items that support the research questions of the study.

This study was conducted by using the representative stratified sample of the selected school districts located in Missouri that are involved in a one to one technology initiative. These school districts were selected based upon response to a questionnaire regarding their district's involvement in one to one technology. The school districts selected range from small rural school settings to schools that are located in major

metropolitan areas within the state. Districts selected for this study either have a one to one technology initiative already in place or have begun the process to implement in their respective district. Identities of those taking part in the survey are confidential.

Instrumentation

An online survey was created to collect the data for this study. QuestionPro was selected as the administration tool that administered the survey and collected responses. The survey was separated into sections that inquired about 21st Century Skills, 21st Century Pedagogy and Professional Development. Prior to the survey the researcher contacted the Superintendent of schools at each of the selected districts to ensure that the district would allow the teachers and administrators to participate in the study. The survey included educators at any grade level involved with a one to one initiative. The survey was then administered by sending the link to the survey by email to the Superintendent or Assistant Superintendent of each district in the population with the request for them to forward the survey out to the teachers and administrators who qualify for participation in their district. Participation was hoped to increase since the participants would receive the email for invitation to participate from a known professional in their district. The survey was to be completed and returned in electronic format via QuestionPro. The survey was left open for a set time period of 29 days to allow for participants to take part in the study. Email reminders were sent two times during the period to those districts included in the study. The first reminder was sent on day eight and the second reminder was sent on day 15. The survey was separated into sections which included an introduction letter, demographics, 21st Century Skills, and 21st Century Pedagogy.

The introduction letter provided instructions for completing the survey as well as the purpose for the survey and the researcher's information. Demographic information collected included district, school and grade level or position and years of experience and gender of the person completing the survey. The 21st Century Skills section measured knowledge, perceptions, and beliefs about 21st Century skills. This section focused specifically on the participant's beliefs regarding the educational value, and relevance of 21st Century skills. These skills include creativity and innovation, critical thinking and problem solving, communication and collaboration, information literacy, media literacy, information/communications and technology literacy, flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability as well as leadership and responsibility. Participants were given the opportunity to respond to questions with selections that were formatted into a Likert scale allowing them to select from one of four possible responses.

The 21st Century Pedagogy section was designed to determine the educator's perceptions regarding identified components of 21st century pedagogy. This part of the survey focused on nine modes of instruction including: differentiated instruction, personalized instruction, project-based learning, concept-based instruction, Socratic instruction, direct instruction, inquiry based instruction, collaborative learning, and interactive instruction. The portion used a four response option Likert scale to identify the value or belief in the use of each instructional model.

A factor analysis was performed on the final results of the study to determine construct validity and the item load on the two scales of the survey. The final survey factor analysis supports the data that was represented in the pilot factor analysis (Table 2)

which indicated if the survey questions were aligned to the scale they were designed to align to. This step allowed the researcher to exhibit the continued construct validity of the survey tool, thereby supporting the value of the study results. Table 3 displays the factor analysis for the final survey results.

Table 3: Confirmatory Factor Analysis

	Scale	
	Pedagogy	Skills
Student learning can increase when the instructor attaches curriculum to students personal interests	.571	.321
Learning activities should be designed to develop reasoning and decision making skills	.427	.451
I believe that student learning can increase when instruction is connected to personalized interests	.633	.280
The ability to research and find support for points of view is an important skill	.146	.664
The teacher should create activities that allow for independent direction of study on concepts	.602	.296
Students need to be able to understand connections among systems to develop solutions to complex problems	.310	.605
Activities that are authentic to the student foster greater learning	.453	.438
Students need to be able to ask significant questions to solve complex problems	.205	.701
Instruction should be customized by teachers based on individual learner needs	.815	.063
Students need to be able to evaluate information successfully	.281	.674
Instruction should be developed to connect to student interests	.539	.435
Students need to be able to use sound reasoning in decision making	.064	.802
Personal learning plans allow students to identify strengths and weaknesses	.677	.284
I believe student learning can increase through differentiated instruction	.487	.157
Students need to be able to apply content to real world problems	.362	.554
Students must be able to analyze information to create solutions to complex problems	.261	.772
Instruction should be customized by teachers based on individual learner needs	.849	.167
Identifying individual students preferred way of learning promotes individual student growth	.711	.214
Learners need to be able to understand connections among systems to develop solutions to complex problems	.274	.627

Note. Principal Components Factor Analysis with Varimax Rotation

In an effort to examine the reliability of the final survey, a final Cronbach's Alpha was run through SPSS using the 176 responses and two scales. Cronbach's alpha for the scale of 21st Century Pedagogy easily met the required .70 by having ($a = .854$). The second scale of 21st Century Skills ($a = .873$) also easily meeting the goal of a .70 or higher. The validity of the survey tool was strengthened due to the scales of both 21st Century Pedagogy and 21st Century Skills continuing their high scores as in the pilot study.

Statistical Treatment of Data

The data collected was analyzed using descriptive statistics as well as ANOVA. QuestionPro is the software that was used to disseminate the questionnaire and collect the data from the questionnaire. Once the data was collected it was uploaded into SPSS to analyze and interpret the data. QuestionPro was used to develop the statistical treatment of data. Data was disaggregated by experience levels, gender, building level assignment, and role to allow for analysis. ANOVA tests compared data collected from educators in different demographics that were designed by the study. This allowed perceptions to be displayed by these participants in each group. ANOVA tests were implemented to compare differences in means of multiple selected groups. This allowed for the author to further investigate and study the difference in means of multiple groups of educators to analyze data surrounding the research questions.

The development of this survey tool was a lengthy process during this project. Initially the author intended to use a previously created survey tool but after initial review by their advisor and committee member, it was determined that a survey unique to this study would need to be crafted. The survey went through many stages of revision from its

initial development to making final revisions following analyzing the results of the pilot study. The tool held up both in factor analysis and in reliability testing supporting that the survey is valuable.

Conclusion

The data collected by this survey tool will provide information that will be of assistance to educators exploring or researching the implementation of one to one technology initiatives to meet the needs of students. The responses to this survey provide a depiction of the perceptions of educators that will provide beneficial when developing teacher training in both the realms of 21st Century Pedagogy and 21st Century Skills. The relevance of 21st century pedagogy and 21st century skills is being echoed by educators throughout the state and nation. The reliability and validity of this study has been supported through the statistical analysis of results of all stages of pilot testing as well as analyzing the final survey responses. Information that the survey has collected is pertinent and valuable and this will be exhibited and explained in length in chapter four of this study.

CHAPTER FOUR

ANALYSIS

The final results of the survey that were loaded into SPSS included 176 responses. Responses were compiled from classroom teachers, specialists, instructional coaches, building level and district level administrators. Demographic data on each participant was collected. ANOVA as well as independent t-tests were used to analyze the collected data. The information in chapter four, based upon the survey instrument, will be representative data that will provide insight to the initial research questions. Beyond the demographic data, the survey provided questions regarding 21st century pedagogy and 21st century skills and responses were collected using a scale of 1.00-4.00 with 1.00 being Strongly Agree and 4 being Strongly Disagree. Means will be used to illustrate educator perceptions in regard to both 21st century skills and 21st century pedagogy.

Scale statistics in regard to 21st Century Pedagogy

The Scale Statistics of the questions focused upon 21st Century Pedagogy displayed a mean score that indicated educators are favorable toward such pedagogy. There were ten questions on the survey that were focused on pedagogy. With a mean score of 16.15, it would appear that the educators responded most frequently with strongly agree or agree in regard to twenty-first pedagogy. The responses did show a slight spread with a standard deviation of 4.122. This calculation supports a slight variation in the responses. Table 4 will display the mean, standard deviation and number of items for the pedagogy scale.

Table 4: Mean and Standard Deviation for Pedagogy Scale

Scale Statistics for Pedagogy			
		Std.	
Mean	Variance	Deviation	N of Items
16.15	16.989	4.122	10

The pedagogy scale of the survey was designed to answer research question two of the study. Research question two asks what perceptions, in regard to 21st Century Pedagogy, are held by educators who are involved with a one to one technology initiative. The pedagogy scale was designed using the literature review to define and clarify what 21st Century Pedagogy is and what are the perceptions of educators who are involved with implementing this pedagogy. The mean for this scale was 16.15 with a possible range of 10 to 40 and a standard deviation of 4.122. The mean shows a favorable perception on 21st Century Pedagogy by educators. This data shows that the educators who participated in this survey selected responses that generalized a positive perception about 21st Century Pedagogy.

Scale statistics in regard to 21st Century Skills.

The scale statistics of the questions that were centered on 21st Century Skills indicated an even higher mean which indicated educators had a more favorable perception of 21st Century Skills. With a mean score of 12.86 that would translate very closely to a ‘strongly agree’ on the likert scale. Educators who were involved in the study represented, through their responses that educators involved in a one to one technology initiative have a very positive view about the importance of 21st Century Skills. The standard variation was lower than on pedagogy with a standard deviation of 3.230. This indicates that the answers in regard to 21st Century Skills were more closely aligned than

on pedagogy, again supporting the strong feelings in regard to the skills scale. Table 5 will represent the scale statistics for skills.

Table 5: Mean and Standard Deviation for Skills

Scale Statistics for Skills			
Mean	Variance	Std. Deviation	N of Items
12.86	10.436	3.230	9

The scale on 21st Century Skills was designed to provide insight on research question one. Research question one asks what perceptions, in regard to 21st Century Skills, are held by educators who are involved with a one to one technology initiative? This scale included nine questions focused on 21st Century Skills by searching out educator’s perceptions about these skills. The skills were defined and explained within the literature review. The skills scale had a mean of 12.86 with a possible range of 9 to 36 and a standard deviation of 3.230. The low mean score indicates that there was a favorable perception on skills by educators. Their responses were more closely aligned than on pedagogy.

Inferential Statistics

There were 20 questions initially written for the two scales of the survey. Out of these 20 questions, one question was eliminated from the survey during the expert pilot process and three questions were reworded after analyzing the results of the pilot survey. The remaining questions held up to the final factor analysis as well as to the Cronbach’s alpha which held the pedagogy scale at .854 and the skills scale at .873. These values support the reliability of the survey tool.

The inferential statistics that were calculated were based on the 19 questions that aligned to a scale of the survey. The data was analyzed to expose any and all statistically significant differences between responses of the groups that were created by the demographic categories of the participants. The demographic questions included the following: 1) I currently serve as a?, 2) What is my total years in education?, 3) My primary building assignment is?, 4) What is your gender?, 5) Have you received professional development focused on the following: differentiated instruction, personalized instruction, project-based learning, concept-based learning, Socratic learning, direct instruction, inquiry-based learning, collaborative learning, interactive instruction?, 6) Have you received professional development in teaching the following: creativity and innovation, critical thinking, communication and collaboration, information literacy, media literacy, information, communications and technology literacy, flexibility and adaptability, initiative and self-direction, social and cross curricular skills, productivity and accountability and leadership and responsibility?

Table 6 below will represent the results of the ANOVA for the 21st Century Skills scale.

Table 6: ANOVA for 21st Century Skills Scale

		Sum of Squares	df	Mean Square	F	Sig.
Skills	Between Groups	103.508	4	25.877	2.602	.038
	Within Groups	1660.562	167	9.943		
	Total	1764.070	171			

For both the skills and the pedagogy scale, there was a statistically significant difference found between the roles of the educators. For the skills scale, the most

statistically significant differences were found between classroom teachers and specialists. When Tukey’s Honest Significant Difference (HSD) test was performed, classroom teachers were found to be significantly less favorable, with a mean of 13.2403 and standard deviation of 3.22, towards skills than specialists, with a mean of 10.8750 and a standard deviation of 2.85.

Table 7: ANOVA for 21st Century Pedagogy Scale

		Sum of Squares	df	Mean Square	F	Sig.
Skills	Between Groups	195.933	4	48.983	2.778	.029
	Within Groups	2961.847	168	17.630		
	Total	3157.780	172			

Table 7 above shows the ANOVA results for the 21st Century Pedagogy Scale. For the pedagogy scale, statistically significant differences were found between the classroom teachers, who did not favor pedagogy, with a mean score of 16.8837 and standard deviation of 4.24, and instructional coaches who were more favorable toward pedagogy with a mean score of 12.5000 and a standard deviation of 2.64. There was also a significant difference between building level administrators, who had a mean score of 16.4167 and standard deviation of 3.96, showing a low level of support for pedagogy and the instructional coaches who had a mean score or 12.5000 with a standard deviation of 2.64 showing a favorable perception on pedagogy.

For the demographic of primary building assignment there was a statistically significant difference between groups found in the scale of pedagogy. Table 8 notes these findings.

Table 8: ANOVA for Pedagogy and Building Assignment

		Sum of	df	Mean Square	F	Sig.
		Squares				
Pedagogy	Between Groups	268.982	3	89.661	5.238	.002
	Within Groups	2910.219	170	17.119		
	Total	3179.201	173			

When Tukey’s HSD was performed it was found that the significant differences in the pedagogy scale was between educators in elementary settings and high school settings as well as educators in high school settings compared to those in central office assignments. Elementary educators showed a mean of 15.010 with a standard deviation of 4.04 compared to a mean of 17.823 with a standard deviation of 4.48 for the high school educators indicating that the high school educators are less favorable toward the pedagogy discussed in the survey. When comparing the other statistical difference, which was between high school assignment and central office assignment, the high school again had the higher mean of 17.823 while the central office educators had a mean of 14.85 with a standard deviation of 4.06. The central office group recorded the lowest mean score of all groups indicating that they are the most supportive in regard to the pedagogy scale. Each of these three groups, while having differences in their means, all showed less favor towards pedagogy than they did towards skills. Data representing perceptions towards pedagogy, indicated by the multiple groups, would lead to consideration that the perceptions of pedagogy are impacted by the primary building assignment. The less favorable perceptions could be attributed to pedagogy defining teacher or educator actions while skills are more representative of student work or performance.

Professional Development Statistics

The third research question of this study asks the following: Have educators involved with a one to one technology initiative been exposed to professional development in 21st Century Pedagogy and 21st Century Skills? To support the research question the survey provided participants the opportunity to respond to the survey when asked if they had received professional development in the listed classifications of 21st Century Skills and 21st Century Pedagogy.

The participants were asked to respond to nine identified categories of pedagogy. Participants selected yes or no to their exposure to professional development in these defined categories. Participants were asked to respond to 11 specific categories about skills. The responses were collected using the yes or no response in the same manner as for the pedagogy scale. For this study yes was given a value of 1 and no was given a value of 2. The table below will provide a display of the mean of each category.

Table 9: Descriptive Statistics

	N	Mean	Std. Deviation
21st Century Pedagogy			
Differentiated Instruction	175	1.09	.281
Personalized Instruction	166	1.24	.429
Project-Based Learning	168	1.35	.479
Concept-Based Learning	159	1.46	.500
Socratic Learning	157	1.61	.490
Direct Instruction	167	1.16	.364
Inquiry-Based Instruction	165	1.24	.426
Collaborative Learning	172	1.05	.211
Interactive Instruction	160	1.26	.438
21st Century Skills			
Creativity and Innovation	162	1.41	.494
Critical Thinking	166	1.21	.409
Communication and Collaboration	169	1.12	.324
Information Literacy	156	1.37	.485
Media Literacy	158	1.41	.492
Information Communications and Technology Literacy	165	1.22	.414
Flexibility and Adaptability	158	1.53	.501
Initiative and Self-Direction	153	1.54	.500
Social and Cross Cultural Skills	157	1.50	.502
Productivity and Accountability	159	1.49	.501
Leadership and Responsibility	161	1.29	.456

When examining the results of the pedagogy section it was noted that concepts that have been the focus of educational reform or improvement prior to being labeled as a 21st Century Pedagogy, had the lowest mean scores indicating that educators had the most exposure to those categories. Collaborative learning (M=1.05, SD=.211) was the most prevalent, closely followed by differentiated instruction (M=1.09, SD =.281). Direct instruction (M =1.16, SD =.364), inquiry-based instruction (M=1.24, SD= .426), personalized instruction (M=1.24 , SD =.281) and interactive instruction(M=1.26 ,SD= .438) each held means that would indicate that the majority of participants had experienced professional development on those concepts. Concept-based learning (M=1.46, SD = .500) and Socratic learning (M=1.61,SD= .490) both had higher means indicating that fewer educators had received professional development in those areas.

In analyzing the results of the skills question, it appears that fewer educators have been exposed to professional development in those areas compared to pedagogy. This category carried higher means on the average than that of the skills section. Communication and collaboration (M=1.12, SD= .324) was the lowest mean indicating a high number of educators responding yes to receiving professional development in that area. Critical thinking (M=1.21, SD= .409) and communications and technology literacy (M=1.22, SD=.414) round out the top three and the others reported the following Mean scores: Leadership and Responsibility(M=1.29), information literacy (M=1.37), media literacy (M=1.41), productivity and accountability (M=1.49), social and cross cultural skills (M=1.50), flexibility and adaptability (M=1.53), initiative and self-direction (M=1.54).

Summary

The results of this survey have provided supportive data related to the research questions. Through the layers of piloting the survey and the process of running multiple factor analysis and reliability tests, it was confirmed that the survey tool was acting as it was designed and collected data that would be valuable to the researcher and other educators. Through analyzing the data using both descriptive and inferential statistics, the perceptions of educators involved in a one to one technology initiative were visible. By implementing the demographic questions, significant differences between groups were displayed showing that there were statistically significant differences between the demographic groups identified for this study.

For both the skills and the pedagogy scale, there was a statistically significant difference found between the roles of the educators. For the skills scale, the most statistically significant differences were found between classroom teachers and specialists. For the pedagogy scale, statistically significant differences were found between the classroom teachers, who did not favor pedagogy and instructional coaches who were more favorable toward pedagogy. There was also a significant difference between building level administrators showing a low level of support for pedagogy and the instructional coaches who had a mean score showing a favorable perception on pedagogy. This summary of results also shows that there were no significant differences found in years of experience or gender in either scale of pedagogy or skills. Primary building assignment also failed to exhibit any significant difference in the skills scale. The researcher had expected to find significant differences in each of the demographic groups under both scales of pedagogy and skills. Based upon the data, the role of the

educator has the most significant impact on perceptions, followed by primary building assignment. This data was surprising to the researcher and further research would be beneficial to determine more detailed cause.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Through the work of this dissertation, the researcher has had the opportunity to examine the perceptions, both positive and negative, of educators within a one to one technology initiative in regard to 21st Century Pedagogy and 21st Century Skills, as well as determine what avenues of professional development are being implemented in these initiatives. With the support of the data presented, the researcher's conclusions and recommendations will be noted. It is the hope and intent of the researcher that this data and information will provide a resource that will be powerful for educators as they endeavor to continue to enhance the learning of students in their respective schools.

Conclusions

The global society that students are preparing to enter requires students to possess a different skill set than those of past generations. This need puts the urgency of educational reform on the shoulders of current educators. As an educator who is working to provide students necessary skills to enter this technology rich world, it is imperative that instructional approaches and learning objectives be evaluated and renewed to meet this need. In researching approaches to meet this need, one to one technology initiatives came to the forefront of the research. To make this study the most beneficial for the researcher as well as the readers, a focus on one to one initiatives was selected. As these initiatives were reviewed it became apparent that two key elements were foundational. These two elements have been defined in this study as 21st Century Skills and 21st Century Pedagogy.

The purpose of this study was to determine what perceptions educators had in regard to these two key elements one to one technology initiatives. The reason that the study focused upon the perceptions of educators involved in these initiatives was to give current information that was based upon what current and active educators viewed as valuable, effective and successful in the education of today's students. Twenty-First Century Pedagogy is the element that represents the instructional change of this movement. The desired outcome of increased student learning is represented by 21st Century Skills. Twenty-First Century Skills represent the skills and abilities that one to one initiatives strive to instill in students. These two elements of a one to one initiative provide constructs that define and articulate what instructional approaches teachers should implement and what student skills should be acquired to ensure student success in a global society. A research question was also designed to determine what educators involved in a one to one technology initiative were experiencing in the realm of professional development. This question was designed to take a look at what district leaders valued as key learning points for educators to evolve to meet evolving student needs.

With the clarification of these key elements, research questions were written that would drive the data collection process. The research questions were as follows:

1. What perceptions, in regard to 21st Century Skills, are held by educators who are involved with a one to one technology initiative?
2. What perceptions, in regard to 21st Century Pedagogy, are held by educators who are involved with a one to one technology initiative?

3. To what level have educators involved with a one to one technology initiative been exposed to professional development in 21st Century Pedagogy and 21st Century Skills?

By examining the results of the survey the perceptions of educators in the two categories of focus can be found. To develop a survey tool that would put focus on the two key elements of the study, two scales for the instrument were designed. The first scale was designed to collect data on 21st Century Skills. It was created to focus on the first research question which dealt with educator perceptions in regard to 21st Century Skills.

The responses to questions on this scale provided data that displayed that there are significant differences between the demographic groups in regard to perceptions about skills identified in this scale. The responses of educators were compiled and analyzed by using demographic characteristics to exhibit differences in the collective responses of the defined groups.

Collectively the data represented the fact that each of the defined demographic groups of the different educator roles placed a higher level of favor on 21st Century Skills than on that of 21st Century Pedagogy. In the researcher's opinion, this could be due to the thought that it is easier to state what should change for learners than it is to state what should change for educators. Educators are notorious for their resistance to change. Means of each demographic group, which included; elementary, middle school, high school, and central office, were very comparable exhibiting that building assignment did not have a significant impact on educator perceptions of skills. This is not the result that the researcher had expected. The researcher expected to find a significant difference

between elementary and high school. The researcher believed that the difference in instructional approach between elementary and high school educators would, in some way, show difference in perceptions between these two groups. The gender demographic also showed no statistical difference, which was unexpected by the researcher. The researcher did not hypothesize what the difference would be between genders but a difference was expected to be shown.

The second scale of the survey was designed to collect data that was focused on the second research question which dealt with educator perceptions in regard to 21st Century Pedagogy. Responses to this scale of the survey created a view of educator perceptions about pedagogy. Within this scale there were more significant differences between groups in the demographic breakdowns. The first significant difference to be exposed was the difference between classroom teacher and instructional coaches. Instructional coaches had a much lower mean than classroom teachers in regard to their perceptions of pedagogy. The cause for this could be the nature of the positions. Instructional coaches have the responsibility to continually evaluate and improve instruction while classroom teachers are more than likely answering from the perspective of not wanting to change or amend their teaching approach or style. There was also a significant difference between building level administrators and instructional coaches in regard to pedagogy. Data surprisingly exhibited that there was no difference between groups based on years of experience. The researcher believed that the participants in the category of twenty one years of experience and over would have displayed less favorable perception in both pedagogy and skills but that was not the case.

The final research question was designed to determine if educators had been involved with professional development on the specified areas of skills and pedagogy. The question was administered in a format that would implement descriptive statistics to analyze the collected data. Upon collection of the data it was found that elements of pedagogy and skill which had been previously introduced to educators had the highest response of professional development. Differentiated instruction, collaboration and communication, collaborative learning, each had low mean scores indicating a majority of participants had experienced professional development in those areas. Categories such as initiative and self-direction, flexibility and adaptability, social and cross cultural skills, productivity and accountability and Socratic learning had higher means indicating a lower numbers of educators having experience with those elements.

A total of 176 completed responses. There were 256 participants that viewed the survey with 212 of them actually beginning the survey. Thirty-six participants did not complete the survey. The development of the survey tool ended up being one of the most challenging parts of this study. However, by developing a survey piece initially unique to this study, the validity and the reliability of the survey tool were maximized. Through the process of creating the initial survey, going through an expert panel pilot that implemented Rovinelli and Hambleton's (1977) index of item congruency and by performing multiple factor analysis and Cronbach's alpha, a survey tool that is now both reliable and valid has been created. This survey tool could potentially be used by other researchers in the future who wish to perform a similar study that would be designed to further the results of the present study.

Recommendations

The process completed to compile this resource of information has been a venture that has strengthened both the knowledge and the perceptions of the researcher. Through the information collected and presented, educators can access a resource that can provide current and pertinent information regarding insight and understanding of the perceptions of educators involved in some stage of one to one implementation . With a continued focus on educational improvement or reform, this product stands above other resources with the combination of current literature and current educator's feedback.

The success of any educational reform movement partly hinges upon the mindset of the teachers who will be responsible for putting the movement into action. The depiction of active educators who are working in one to one initiatives can provide administrators a guide to support initial teacher training, ongoing professional development as well as identifying the key elements of such a program. It is the desire of the researcher that schools working to implement a one to one initiative would be able to pull valuable information from this study.

To extend and improve this study the researcher would recommend a larger sampling size. The study was introduced to educators in the summer months and the time of year potentially impacted the response rate of the survey. A larger sample size could provide a greater number of demographics that would allow for more support and stronger comparisons to be calculated. In an effort to expand the information that the survey could provide, the researcher would recommend that survey participants be asked to explain their answers through open-ended text. Further insight could be gained

through developing an understanding of what affects the perceptions of educators in regard to one to one technology initiatives.

Further recommendations include expanding the study by compiling comparative data of educators from schools from opposing socioeconomic makeups. This would provide the opportunity to enable school leaders to specifically tailor the approach of implementation to meet the needs of the school culture. Future studies might look at community demographics and determine if technology initiatives would be more successful in schools based on those demographics. It would also be beneficial to try and determine the reason for the differences in demographic groups that were exposed by this study.

Further recommendations would also include that to expand this study, further research could be done examining what methods of 21st Century Pedagogy foster the highest achievement in 21st Century Skills. This study has only worked to depict the perceptions of educators but it has the potential to serve as a foundational piece to inform a study of the instructional methods that are a part of 21st Century Pedagogy and their impact on 21st Century Skills as learning objectives for students.

The potential benefit of this study, mentioned in previous paragraphs was meant to provide examples or opportunities for readers and other researchers to implement the data from the study. It is the intent of the researcher that this study on educator perceptions will provide other educators and researchers a valuable tool to support instruction through one to one technology initiatives after developing an understanding of 21st Century Pedagogy and 21st Century Skills.

Summary

Educators have a responsibility to continue to strive to improve the learning opportunities of each of their students. The immersion of technology into all areas of society today require that our students not only be fluent with technology but that they are able to function in a setting that requires a skill set that allows them to compete and interact in a global society. To meet these needs, the introduction of one to one technology initiatives has taken place. One to one initiatives allow for customized instruction through pedagogical change as well as promoting learning that will foster skills that are necessary for 21st century learners.

The intended outcome of this research was to examine what educators valued and believed in regard to 21st Century Pedagogy and 21st Century Skills. The researcher desired to be able to uncover and understand the views of educators and if those views supported the implementation of stated pedagogy and skills. Through the work of this research, an understanding of the views of educators from defined demographic groups outline a summary of educator perceptions in a one to one technology initiative. With this knowledge base now available, districts who are working toward implementation of a technology initiative or implementation of 21st Century Pedagogy and Skills will have access to insight from current educators to use to support their efforts. The benefit of understanding a teacher's views and beliefs in a program or initiative is valuable. Training teachers to use new pedagogy and to educating them on the new skills that students need, must begin with a clear picture of their perceptions of the pedagogy and skills. This study has developed a reliable and valid survey tool that future researchers can use in the field of 21st century education. The survey tool may provide necessary and

vital data for schools to use to successfully implement instructional change for the 21st Century. It is the hope of the researcher that this product will play a key role in the development of better learning opportunities for student.

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Woolridge, V. W. (2009). *A quantitative study on the relationship between teachers' technology perceptions and math proficiency* (Doctoral dissertation). Available from www.proquest.com.

Appendix A: Expert Pilot

The survey is divided into two sections. Section one is related to 21st Century Pedagogy and section two is related to 21st Century Skills. I am providing a definition for both sections. Please use a rating scale of -1, 0, or 1 to rate each individual question. If the question does not relate to the provided definition rate the question a -1. If you are neutral or unsure if the question specifically relates to the provided definition then rate it a 0. If the question relates well to the provided definition then rate it a 1. Section 1 includes questions 1-9. The focus of this section is to determine the perceptions about individualized learning that is a part of 21st century pedagogy. Section 2 includes questions 10-19. The focus of this section is to determine the perceptions about critical thinking which is a 21st century skill.

Student learning can increase through curriculum that is attached to student's personal interests.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Instruction should be customized by teachers based on individual learner needs.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Instruction should be customized by teachers based on individual learner needs.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Instruction should be developed to connect to student interests.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Personal learning plans allow students to identify strengths and weaknesses.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

I believe student learning can increase through differentiated instruction.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Identifying individual students preferred way of learning promotes individual student growth.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Activities that are authentic to the student foster greater learning.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Students should be given activities that allow for independent direction of study on concepts.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

I believe that student learning can increase through personalized instruction.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

This question will begin section 2-21st Century Skills Learning activities should be designed to develop reasoning and decision making skills.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

The ability to research and find support for points of view is an important skill.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Students need to be able to understand connections among systems to develop solutions to complex problems.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Students must be able to ask significant questions towards solving complex problems.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Students need to be able to create and evaluate information successfully.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Learning activities should be focused on developing student's ability to use sound reasoning in decision making.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Skills that allow students to be able to evaluate information are focused on in my school.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Students must be able to analyze information to create solutions to complex problems.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Students must be able to apply content and theory to authentic, real world problems.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Learners must be able to discover connections among systems to develop solutions to complex problems.

-1 Does Not Relate to Definition
0 Neutral
1 Relates Well to Definition

Appendix B: Pilot Survey

Hello: You are invited to participate in my doctoral dissertation survey titled Educator Perceptions in a One to One Technology Initiative. This survey asks questions about your perceptions regarding 21st Century Learning and 21st Century Pedagogy. It will take approximately 10 minutes to complete the questionnaire. Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for me to learn your perceptions. Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. Thank you very much for your time and support.

I currently serve as a

Classroom Teacher
Specialist
Instructional Coach
Counselor
Building Level Administrator
District Level Administrator

My total years of experience in education is

0-4
5-10
11-20
21+

My primary building assignment is

Elementary School
Middle School
High School
Central Office

I am

Male
Female

I have received professional development focused on the following

	Yes	No
Differentiated Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Personalized Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Project-Based Learning	<input type="checkbox"/>	<input type="checkbox"/>
Concept-Based Learning	<input type="checkbox"/>	<input type="checkbox"/>
Socratic Learning	<input type="checkbox"/>	<input type="checkbox"/>
Direct Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Inquiry-Based Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Collaborative Learning	<input type="checkbox"/>	<input type="checkbox"/>
Interactive Instruction	<input type="checkbox"/>	<input type="checkbox"/>

I have received professional development in teaching the following

	Yes	No
Creativity and Innovation	<input type="checkbox"/>	<input type="checkbox"/>
Critical Thinking and Problem Solving	<input type="checkbox"/>	<input type="checkbox"/>
Communication and Collaboration	<input type="checkbox"/>	<input type="checkbox"/>
Information Literacy	<input type="checkbox"/>	<input type="checkbox"/>
Media Literacy	<input type="checkbox"/>	<input type="checkbox"/>
Information, Communications, and Technology Literacy	<input type="checkbox"/>	<input type="checkbox"/>
Flexibility and Adaptability	<input type="checkbox"/>	<input type="checkbox"/>
Initiative and Self-Direction	<input type="checkbox"/>	<input type="checkbox"/>
Social and Cross Cultural Skills	<input type="checkbox"/>	<input type="checkbox"/>
Productivity and Accountability	<input type="checkbox"/>	<input type="checkbox"/>
Leadership and Responsibility	<input type="checkbox"/>	<input type="checkbox"/>

Student learning can increase through curriculum that is attached to student's personal interests.

Strongly Agree
Agree
Disagree
Strongly Disagree

Learning activities should be designed to develop reasoning and decision making skills.

Strongly Agree

Agree
Disagree
Strongly Disagree

I believe that student learning can increase through personalized instruction.

Strongly Agree
Agree
Disagree
Strongly Disagree

The ability to research and find support for points of view is an important skill.

Strongly Agree
Agree
Disagree
Strongly Disagree

Students should be given activities that allow for independent direction of study on concepts.

Strongly Agree
Agree
Disagree
Strongly Disagree

Students need to be able to understand connections among systems to develop solutions to complex problems.

Strongly Agree
Agree
Disagree
Strongly Disagree

Activities that are authentic to the student foster greater learning.

Strongly Agree
Agree
Disagree
Strongly Disagree

Students must be able to ask significant questions towards solving complex problems.

Strongly Agree
Agree
Disagree
Strongly Disagree

Instruction should be customized by teachers based on individual learner needs.

Strongly Agree
Agree
Disagree
Strongly Disagree

Students need to be able to create and evaluate information successfully.

Strongly Agree
Agree
Disagree
Strongly Disagree

Instruction should be developed to connect to student interests.

Strongly Agree
Agree
Disagree
Strongly Disagree

Learning activities should be focused on developing student's ability to use sound reasoning in decision making.

Strongly Agree
Agree
Disagree
Strongly Disagree

Personal learning plans allow students to identify strengths and weaknesses.

Strongly Agree
Agree
Disagree
Strongly Disagree

I believe student learning can increase through differentiated instruction.

Strongly Disagree
Disagree
Agree
Strongly Agree

Students must be able to apply content and theory to authentic, real world problems.

Strongly Agree
Agree
Disagree
Strongly Disagree

Students must be able to analyze information to create solutions to complex problems.

Strongly Agree
Agree
Disagree
Strongly Disagree

Instruction should be customized by teachers based on individual learner needs.

Strongly Agree
Agree
Disagree
Strongly Disagree

Identifying individual students preferred way of learning promotes individual student growth.

Strongly Agree

Agree
Disagree
Strongly Disagree

Learners must be able to discover connections among systems to develop solutions to complex problems.

Strongly Agree
Agree
Disagree
Strongly Disagree

Appendix C: Final Survey

Hello, You are invited to participate in my doctoral dissertation survey titled Educator Perceptions in a One to One Technology Initiative. This survey asks questions about your perceptions regarding 21st Century Learning and 21st Century Pedagogy. It will take approximately 10 minutes to complete the questionnaire. Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for me to learn your perceptions. Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. Thank you very much for your time and support.

I currently serve as a

1. Classroom Teacher
2. Specialist
3. Instructional Coach
4. Counselor
5. Building Level Administrator
6. District Level Administrator

My total years in education is

1. 0-4
2. 5-10
3. 11-20
4. 21 +

My primary building assignment is

1. Elementary
2. Middle School
3. High School
4. Central Office

I am

1. Male
2. Female

I have received professional development focused on the following

	Yes	No
Differentiated Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Personalized Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Project-Based Learning	<input type="checkbox"/>	<input type="checkbox"/>
Concept-Based Learning	<input type="checkbox"/>	<input type="checkbox"/>
Socratic Learning	<input type="checkbox"/>	<input type="checkbox"/>

Direct Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Inquiry-Based Instruction	<input type="checkbox"/>	<input type="checkbox"/>
Collaborative Learning	<input type="checkbox"/>	<input type="checkbox"/>
Interactive Instruction	<input type="checkbox"/>	<input type="checkbox"/>

I have received professional development in teaching the following

	Yes	No
Creativity and Innovation	<input type="checkbox"/>	<input type="checkbox"/>
Critical Thinking	<input type="checkbox"/>	<input type="checkbox"/>
Communication and Collaboration	<input type="checkbox"/>	<input type="checkbox"/>
Information Literacy	<input type="checkbox"/>	<input type="checkbox"/>
Media Literacy	<input type="checkbox"/>	<input type="checkbox"/>
Information, Communications, and Technology Literacy	<input type="checkbox"/>	<input type="checkbox"/>
Flexibility and Adaptability	<input type="checkbox"/>	<input type="checkbox"/>
Initiative and Self-Direction	<input type="checkbox"/>	<input type="checkbox"/>
Social and Cross Cultural Skills	<input type="checkbox"/>	<input type="checkbox"/>
Productivity and Accountability	<input type="checkbox"/>	<input type="checkbox"/>
Leadership and Responsibility	<input type="checkbox"/>	<input type="checkbox"/>

Student learning can increase when the instructor attaches curriculum to students personal interests.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Learning activities should be designed to develop reasoning and decision making skills.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

I believe that student learning can increase when instruction is connected to personalized interests.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

The ability to research and find support for points of view is an important skill.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

The teacher should create activities that allow for independent direction of study on concepts.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Students need to be able to understand connections among systems to develop solutions to complex problems.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Activities that are authentic to the student foster greater learning.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Students need to be able to ask significant questions to solve complex problems.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Instruction should be customized by teachers based on individual learner needs.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Students need to be able to evaluate information successfully.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Instruction should be developed to connect to student interests.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Students need to be able to use sound reasoning in decision making.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Personal learning plans allow students to identify strengths and weaknesses.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

I believe student learning can increase through differentiated instruction.

1. Strongly Disagree
2. Disagree
3. Agree
4. Strongly Agree

Students need to be able to apply content to real world problems.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Students must be able to analyze information to create solutions to complex problems.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Instruction should be customized by teachers based on individual learner needs.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Identifying individual students preferred way of learning promotes individual student growth.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Learners need to be able to understand connections among systems to develop solutions to complex problems.

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

Appendix D: Consent Email

Good Afternoon,

I am Jeff Mingus and I am the superintendent at Forsyth Schools. I am also working to finish my doctoral program with Southwest Baptist University. I am completing a study on "Educator Perceptions in One to One Technology Initiatives". I am surveying staff members that have been involved with a one to one technology initiative on 21st century pedagogy and 21st century skills.

I am writing to ask if you will allow your staff to take part in my survey. It is a quick survey and only takes an average of 6 minutes to complete. **I will be sending you an email immediately following this that you can easily forward to any staff members who have been involved.**

I appreciate your time and hope that you will take part in the survey and will allow your staff to do so as well. Please let me know if you have any questions.

Respectfully,

Jeff Mingus