

A COMPARISON OF ADMINISTRATORS' AND TEACHERS' PERCEPTIONS OF
NATIONAL TECHNOLOGY STANDARDS

by

Patricia C. Wilkins

A dissertation submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Education in
Educational Leadership

Charlotte

2014

Approved by:

Dr. Robert Algozzine

Dr. John Gretes

Dr. Chuang Wang

Dr. Andrew Polly

©2014
Patricia C. Wilkins
ALL RIGHTS RESERVED

ABSTRACT

PATRICIA C. WILKINS. A comparison of administrators' and teachers' perceptions of national technology standards. (Under the direction of DR. ROBERT ALGOZZINE and DR. JOHN GRETES.)

The need for teachers and administrators to select and use appropriate and effective technologies to support instruction is critical for the academic and social success of students. The purpose of the study was to document and compare administrators' and teachers' perceptions related to National Technology Standards (NETS). The research was intended to assist district level leaders in making informed decisions to identify plausible professional development (PD) training needs of school administrators and teachers. The mixed-method study was conducted in a large school district in the southeastern region of the United States. Participants included elementary and middle public school administrators and teachers. Survey and interview data depict both groups view pedagogical practices of high importance. Despite the fact that results of the online survey reveal both groups engaged in PD, results from the semi-structured interview depict an ongoing need for purposeful selection of technology training opportunities. Advances in technology are constant and to provide engaging learning environments for all students professional development grounded in research is essential for both administrators and teachers to influence leadership and classroom practices.

DEDICATION

This study is dedicated to the following family members, who each played an important role in my life, throughout my professional career, and most recently provided me the support necessary to achieve this accomplishment:

My father, Anthony, taught me the importance of positive thinking.

My mother, Antoinette, encouraged me to choose teaching as a profession.

My sister, Joann, encouraged me to take breaks along the way.

My sister, Toni, taught me the importance of self-discipline.

My sister, Rita, reminded me not to be so hard on myself.

My brother, Ron, encouraged me to laugh at mistakes and keep going.

My son, Spencer, was my source of humor at times when I needed it most.

My daughter, Lexi, was my cheerleader when I needed encouragement.

My husband, Dwain, was my confidant, throughout the entire process.

ACKNOWLEDGEMENTS

This process has been much like a journey. When a journey starts, it can never actually begin without proper planning. It cannot continue without adequate support. Most importantly, if all goes as planned, it typically ends with a clearer understanding of unanswered questions sought after from continued interest. There are a number of very important people that I would like to recognize for playing imperative roles in ensuring my journey started, continued, and ended successfully.

My journey began with encouragement from my husband, Dwain and my Department Chair, Dr. Dawson Hancock; it continued with personal support from family members, colleagues, friends, and fellow doctoral students; and came to fruition with the guidance of my dissertation co-chairs, Dr. Robert Algozzine and Dr. John Gretes; and from committee members, Dr. Chuang Wang and Dr. Andrew Polly. Thank each of you for your feedback, guidance, and support along the way.

I would also like to acknowledge my parents, immigrants from Italy, who laid the foundation for me to be successful. My father always said, “The hardest step to starting anything is the first step.” He was right. He was a role model, showing me how to take chances, by starting his own auto mechanic business with a high school education and a wife and five-children to support. My mother instilled the importance of an education, the desire for me to continue to learn, and the determination to never give up. Thanks Mom and Dad.

I would like to express special gratitude to my immediate family who supported me from step one, each additional step along the way, and stuck by my side up until the final step in this journey. My husband, Dwain, and my adult children, Alan and Alexis

were always very positive and supportive of countless sacrifices of time that took me away from ‘family time’ due to my doctoral work. My husband realized the sacrifices it would take, but encouraged me to begin the journey promising to support me along the way. He endured countless hours of listening to stories of concerns and content along my journey. My children supported and cheered me on along the way. They knew when to jump in and provide words of humor and words of encouragement. Like my husband, they were always there to listen and provide support. If it were not for all three of them and their continued, concerted support, I would not have been successful. Thanks Dwain, Spencer, and Lexi.

Another special group of people are my dissertation committee members. I could not have accomplished this feat without the continual support of my committee members. Dr. Robert Algozzine and Dr. John Gretes served as my dissertation co-chairs and confidants. Dr. Algozzine provided me guidance throughout the entire process. Dr. John Gretes selflessly continued to serve on my committee and provided me timely feedback well into his first year of retirement. I am forever grateful for their expertise, commitment, and support from the beginning to end of this process. Dr. Chuang Wang and Dr. Andrew Polly also served on my committee providing their expertise, support, and words of encouragement throughout the dissertation process. Dr. Wang continually reminded me to be confident and Dr. Polly reminded me of the importance of balance. Thanks Drs. Algozzine, Gretes, Wang and Polly for your willingness to be active throughout my journey.

I would also like to express thanks to my siblings (Joann, Antoinette, Rita, & Ron), my longtime college buddies (Teresa, Wanny, & Jarma), my friends (Tammy &

Susan), College of Education office managers (Jen, Kathie, & Kristine), and my doctoral classmates (Lorraine, Kris, Scottie, Laura, Amanda, & Tammy) I never felt alone in the journey thanks to each of these people for reaching out to me and touching base when I needed your support and or advice. Your phone calls, text messages, voicemails, cards, letters, and hugs were received at times when they were most needed, thanks everyone!

Another group of people that played a part in this journey were my previous administrators, professors, colleagues, relatives, teachers, and students. There are several people from each of these groups that have provided me words of advice and encouragement throughout my school and professional years. This group is too large to list individually; however I wanted to recognize this special group of people for their support. Their encouraging words have stayed with me and have helped to guide and support me along this journey. Thanks to those of you who agreed and participated in my pilot test of my survey and interview. Your time and feedback provided me the assistance I needed to make appropriate changes prior to the study. Your words of advice will stay with me forever; thank each and every one of you!

Last but not least, I would like to thank the Superintendent and cooperating administrators and teachers for agreeing to assist in my study. It takes forward thinking Superintendents that are not fearful of what data may reveal. It takes administrators and teachers that are willing to give of their time to provide the needed information. I would like to thank the Superintendent of the school system that participated for permitting me to study your school district. I am additionally grateful for the willingness of participating administrators and teachers that offered their time by completing the survey and to those that additionally participated in the semi-structured interviews. If not for your willingness

to participate, I would not have had the essential data to interpret the findings. The important take away in this journey, like many, is that it takes a diverse group of people each willing to give unselfishly of their time. Together we can make a difference in the lives of students for a brighter future!

TABLE OF CONTENTS

LIST OF TABLES	xii
LIST OF ABBREVIATIONS	xiii
CHAPTER 1: INTRODUCTION	1
Historical Perspective	1
Statement of Problem and Purpose	6
Delimitations	8
Limitations	8
Assumptions	8
Definitions	9
Summary and Organization of Dissertation	10
CHAPTER 2: REVIEW OF LITERATURE	11
Educational Standards	11
National Education Technology Standards	13
National Education Technology Standards for School Administrators (NETS-A)	14
National Education Technology Standards for Teachers (NETS-T)	15
TECHNOLOGY IN EDUCATION	16
Changing Student Learning	18
Changing School Environment	19
Obstacles to Technology Use in Schools	20
USING THE NETS TO GUIDE CHANGE	22
SUMMARY AND FOCUS OF RESEARCH	24

CHAPTER 3: METHOD	27
Research Questions	28
Participants and Setting	28
Procedure	31
Instrumentation	33
Design and Data Analysis	42
Summary	43
CHAPTER 4: RESULTS	44
Perceptions of Teachers	44
Perceptions of Administrators	46
Comparison of Teacher and Administrator Perceptions	47
CHAPTER 5: DISCUSSION	58
Analysis of the Findings	59
Implications for Improvement of Practice	62
Limitations	64
Recommendations for Future Studies	64
Conclusion	65
REFERENCES	69
APPENDIX A: NATIONAL EDUCATION TECHNOLOGY STANDARDS FOR ADMINISTRATORS (NETS-A)	75
APPENDIX B: NATIONAL EDUCATION TECHNOLOGY STANDARDS FOR TEACHERS (NETS-T)	77
APPENDIX C: EMAIL REQUEST TO ADMINISTRATORS AND TEACHERS	79
APPENDIX D: IRB APPROVAL	80

APPENDIX E: LETTER TO ASSISTANT SUPERINTENDENT	81
APPENDIX F: LETTER TO PARTICIPANTS	82
APPENDIX G: FOLLOW-UP EMAIL FOR SURVEY	83
APPENDIX H: TECHNOLOGY SURVEY FOR EDUCATIONAL LEADERS (TSEL)	84
APPENDIX I: PERMISSION TO USE SURVEY FROM DR. JAMES G. ALLEN	93
APPENDIX J: PERMISSION TO USE SURVEY FROM DR. ALGOZZINE AND DR. FLOWERS	94
APPENDIX K: APPROVAL FROM DR. JAMES G. ALLEN TO USE ETPS	95
APPENDIX L: APPROVAL FROM DR. ALGOZZINE AND DR. FLOWERS TO USE BTCEI	96
APPENDIX M: ITEM STANDARDS MATRIX	97
APPENDIX N: EMAIL/PHONE SCRIPT FOR INTERVIEW INVITES	100
APPENDIX O: TECHNOLOGY INTERVIEW FOR EDUCATIONAL LEADERS (TIEL)	101
APPENDIX P: COPYRIGHT PERMISSION FROM ISTE TO USE NETS	105

LIST OF TABLES

TABLE 3.1: Summary of demographic characteristics	30
TABLE 3.2: Access to home computer	31
TABLE 4.1: Means, standard deviations, and comparison statistics for competence ratings of NETS standards	47
TABLE 4.2: Means, standard deviations, and comparison statistics for importance ratings of NETS standards	49
TABLE 4.3: Correlations between ratings of competence and importance across standards	50
TABLE 4.4: Themes of open ended items of survey and interview	56
TABLE 4.5: Themes of interview items TIEL interview	56

LIST OF ABBREVIATIONS

BTCEI	Basic Technology Competencies for Educators Inventory
BTCEI-R	Basic Technology Competencies for Educators Inventory Revised
CCSS	Common Core State Standards
CCSSI	Common Core State Standards Initiative
CCSSO	Council of Chief State School Officers
CI	Confidence interval
ETPS	Educational Technology for Principal's Survey
ICTs	Information and Communication Technologies
IRB	Institutional Review Board
ISTE	International Society for Technology in Education
<i>LL</i>	Lower limit (as of a CI)
<i>M</i>	Sample mean
<i>n</i>	Number of cases (generally in a subsample)
<i>N</i>	Total number of cases
NASA	National Aeronautics and Space Administration
NCES	National Center for Education Statistics
NCLB	No Child Left Behind
NETP	National Education Technology Plan
NETS	National Technology Standards
NETS-A	National Technology Standards for Administrators
NETS-C	National Technology Standards for Coaches
NETS-CSE	National Technology Standards for Computer Science Educators

NETS-S	National Technology Standards for Students
NETS-T	National Technology Standards for Teachers
NGA	National Governors Association
NGA-Center	National Governors Association Center for Best Practices
PD	Professional development
r	Estimate of the Pearson product-moment correlation coefficient
SD	Standard deviation
SRL	Self-Regulated Learning
TIEL	Technology Interview for Educational Leaders
TSEL	Technology Survey for Educational Leaders
TSSA	Technology Standards for School Administrators
UL	Upper limit (as of a CI)
UNESCO	United Nations Educational, Scientific, and Cultural Organization
USDOE	United States Department of Education

CHAPTER 1: INTRODUCTION

The National Center for Education Statistics [NCES] (2004) reported a four-to-one computer-to-student ratio; unfortunately increased availability of technology in the schools has not necessarily led to improvement in classroom teaching practices (Lim & Chai 2008; Lowther et al. 2008). Relevant professional development (PD) opportunities for implementation of technology use are essential for changes to take place in the classroom environment. Systematic surveys and self-assessments provide a basis for policy makers' and other professionals' decision making related to core technology competencies and ongoing PD needs. The purpose of this research was to document and compare administrators' and teachers' perceptions related to National Technology Standards (NETS) as evidence of professional development content and practice needs.

Historical Perspective

Although access to technology resources continues to increase in schools each year, there are insufficient data to validate improvement of the quality of instruction to enhance student learning or increased test scores. For example, when examining student achievement at the national level, only 34% of 8th grade students performed at or above proficiency in reading and mathematics (NCES, 2008). While technology is evident in the majority of citizens' daily lives, many professionals believe that it is not being used effectively for instruction in school settings due to a lack of competencies and skills as well as appropriately-relevant PD opportunities (Fullan, 2001; Clausen, Britten, & Ring,

2008; Hermans, Tondeur, Valcke, & Van Braak, 2008). A 2009 report on United States trends confirmed that only 20% of states actually require technology training, testing for recertification, or participation in technology-related professional development (Hightower, 2009). The problem may also be related to a lack of contextual fit between the needs of teachers and administrators and PD offerings (ISTE, 2011, 2013).

To truly affect long-term, systemic change the professional development approach must be designed to address the needs of the individual, within the context of their educational setting and the broader reform agenda, in a manner that ensures a durable PD effort over time. PD of this nature requires a paradigm shift away from the traditional training approach toward one that better aligns with national education reform goals.

(Wells, 2007, p. 102).

If used as intended, the National Education Technology Standards (NETS) provide guidance to assist P-12 teachers and administrators in their selection of plausible staff development needs to improve the delivery of instruction as well as leadership for best practices in professional development growth (ISTE, 2011).

For more than twenty-five years, researchers have noted that teachers would benefit with knowledge and training about technology to effectively integrate it into the curriculum. In the late 90's, a Basic Technology Competencies for Educators Inventory (BTCEI) was developed to evaluate critical areas that support and enhance professional productivity and information access needed by educators (Flowers & Algozzine, 2000). The BTCEI measured perceptions in the following 9 domains: basic computer operation skills; setup, maintenance, and trouble shooting of equipment; word processing;

spreadsheets; databases; networking; telecommunications; media communication; and, social, legal, and ethical issues. The BTCEI had a high internal consistency reliability, with reliability coefficients ranging from .87 to .96, and adequate stability reliability for decision making related to needs assessments and ongoing PD planning. Use of the BTCEI was recommended to assess basic technology competencies of pre-service, novice, and career educators and their professional development needs.

As knowledge, needs, and use advanced, technology and information literacy has become an increasingly important requirement in schools (Center for Applied Research in Educational Technology, 2000; Corporation for Public Broadcasting, 2003; U.S. Department of Education, 2004). The No Child Left Behind (NCLB) Act of 2001, signed into law by President George W. Bush in January 2002, requires each student to be technologically literate by the eighth grade. In 2002 the International Society for Technology in Education (ISTE) initiated the National Education Technology Standards (NETS) project. The project was a collaborative effort of the U.S. Department of Education, the Milken Exchange on Education Technology, and Apple Computer and was funded by the National Aeronautics and Space Administration (NASA) to establish the first set of National Technology Standards for teachers and students.

In November 2001, the Collaborative for Technology Standards for School Administrators (TSSA Collaborative) realizing the pivotal role that principals play in determining how technology is used in schools, established a set of technology standards for school administrators. The collaborative complements the National Education Technology Standards for Teachers and Students (NETS-T, NETS-S) work of the ISTE. The TSSA Collaborative recommended the standards be communicated as five

statements along with corresponding set of performance indicators for each. In February 2002, ISTE adapted the TSSA as the ISTE NETS for Administrators (NETS-A). The work resulted in the development of the following five standards for technology leadership:

1. Leadership and Vision. This standard encouraged leaders to facilitate the development of a shared vision and to cultivate an environment that will realize that vision.
2. Learning and Teaching. This standard encouraged leaders to ensure the effective integration of teaching, learning, and technology.
3. Productivity and Professional Practice. This standard focused on the needs of leaders to demonstrate their technological savvy as they model, support, and lead technology integration.
4. Support, Management, and Operations. This standard addressed the need for leaders to develop, implement, and monitor technology policies, human and financial infrastructure, and plans.
5. Assessment and Evaluation. This standard described how leaders should use technology to collect and analyze data regarding appropriate uses of technology and to use such data to inform instructional decisions.

Of course, simply having a set of standards in place will not necessarily impact technological pedagogy improvements; in fact, it is essential to additionally obtain active leaders' involvement in the process. According to ISTE Chief Executive Officer Don Knezek, "There is a wealth of evidence attesting to the importance of leadership in

implementing and sustaining systemic reform in schools; therefore, it is essential that we focus seriously on leadership for technology in schools,” (ISTE, 2013).

Just as curriculum development involves buy-in from all involved parties, so does technology implementation (Fullan, 2001). In 2000, the International Society for Technology in Education (ISTE) began developing new standards with input from the field. The standards were revised again in 2007 for students (NETS-S), and 2008 for administrators (NETS-A) and teachers (NETS-T)¹. In order to provide guidance and support appropriate and effective use of current technologies in schools, ISTE provides five different ‘families’ (sets) of standards (ISTE, 2013). In addition to the three set sets mentioned above, two additional sets include those for coaches (NETS-C) and computer science educators (NETS-CSE). The work resulted in the development of the following five standards (NETS-T) for teachers:

1. Facilitate and Inspire Student Learning and Creativity. This standard encourages teachers to facilitate learning experiences by using their knowledge of subject matter to advance student learning in face-to-face and virtual environments.
2. Design and Develop Digital Age Learning Experiences and Assessments. This standard encourages teachers to create authentic learning experiences that maximize content learning and use contemporary tools and resources to assess student learning.
3. Model Digital Age Work and Learning. This standard encourages teachers to use collaborative skills in a digital society to support student learning.

¹ In 2014, ISTE changed the name but not the content from NETS to ISTE Standards.

4. Promote and Model Digital Citizenship and Responsibility. This standard encourages teachers to understand and exhibit appropriate ethical and legal behavior in an evolving digital culture throughout professional practices.
5. Engage in Professional Growth and Leadership. This standard encourages teachers to continuously improve professional practices by promoting and demonstrating effective use of technology resources and model lifelong learning.

ISTE has a great deal of evidence, which demonstrates the significance of leadership in the area of technology regarding both implementation and reform in schools (ISTE, 2011). While ISTE provides direction for school leaders to guide schools with technology implementation, the standards are not a requirement for schools. The ISTE website provides resources for teachers and administrators to contact representative in Congress to influence policy makers in our country in the hope of improving use of instructional technology in schools.

Statement of Problem and Purpose

Clausen, Britten, and Ring (2008) found that in order for technology to be used effectively, administrators and teachers must work in collaboration to build a school community with open communication in a non-threatening setting. To create necessary conditions for effective technology use in schools, administrators must additionally provide both knowledge and support to teachers wanting to use technology in their classrooms (Clausen, et al, 2008). In many schools in the United States, administrators, from superintendents to principals, play fundamental roles in influencing how technology is valued and used to support instruction and core academic and social outcomes. A wide

array of evidence confirming the importance of leadership in transforming schools into a digital age by employing and maintaining systemic reform in schools exists; therefore, it is crucial that attention to leadership in the area of technology be established in schools (ISTE, 2011). Regarding influence upon student outcomes; data reveal that, technology leadership by administration is secondary to instruction provided within the classroom (CCSSO, 2008). Appropriate professional development for both administrators and teachers will ensure suitable, effective use of technology will occur.

Preparing students with skills, knowledge, and expertise needed to function in an increasingly digital, global society requires support from school leaders and teachers who are equipped to guide technological changes in their schools and who infuse technology into the classrooms. Despite the time school administrators and teachers spend each year on PD, technology hardware, and software in school systems technology resources are often underused.

The purpose of the study was to document and compare administrators' and teachers' perceptions of NETS-A 2009 (Appendix A) and NETS-T 2008 (Appendix B) standards. The researcher addressed three questions:

1. What are the self-reported competency levels and perceptions of importance of NETS standards for teachers in a large southeastern school district?
2. What are the self-reported competency levels and perceptions of importance of NETS standards for administrators in a large southeastern school district?
3. To what extent are self-reported perceptions of competence and importance of NETS standards similar for administrators and teachers?

Findings provide a basis for identifying plausible PD needs of school administrators and teachers to support appropriate and effective use of current technologies in schools. They also support building an awareness of technology standards for district level personnel, school administrators, and teachers and provide a basis for making informed decisions to improve PD training.

Delimitations

Participants included elementary and middle school administrators and teachers from one large school district in the southeastern region of the United States. Perceptions of competence and importance were restricted to the NETS-A and NETS-T standards.

Limitations

Participation was voluntary and self-reported electronic surveys were distributed and used to document and compare school administrators and teachers' perceptions and knowledge of the National Technology Education Standards for Administrators (NETS-A) and/or National Technology Education Standards for Teachers (NETS-T). In addition, self-reported surveys were used to prioritize the level of knowledge administrators and teachers have with regard to the NETS-A and NETS-T performance indicators identify PD needs. To address potential limitations of single-sample survey research, including integrity of self-reporting and response rates, reminder emails were sent to non-respondents and follow-up interviews were conducted with randomly selected participants to establish convergent validity of survey responses.

Assumptions

The following assumptions underlie the research:

1. All participants had some knowledge of technology standards.

2. All participants' independently completed and returned surveys.
3. All participants completed the surveys honestly.

Definitions

The key terms used in the study are defined as follows:

1. Educational Technology – technology that is used to improve curriculum and instruction in the classroom (Grey-Bowen, 2010, p. 16)
2. NETS-A – are the standards for evaluating the skills and knowledge school administrators and leaders need to support digital age learning, implement technology, and transform the education landscape (ISTE, 2013).
3. NETS-T – are the standards for evaluating the skills and knowledge educators need to teach, work, and learn in an increasingly connected global and digital society (ISTE, 2013).
4. Professional Development (PD)– educators working with administrators, colleagues, and experts to better classroom practice; activities for educators to develop the knowledge, skills, practices, and dispositions they need to help students perform at higher levels (Freidus, et al, 2009)
5. Technology – applications of hardware intended to be used with or without a personal computer (Windows or Mac OS); electronic device that can aid in accomplishing a certain task, such as learning a concept or researching a term. (Papa, 2011a)
6. Technology Integration – the use of technology in a learning environment to enhance understanding of curricular (Papa, 2011a)

7. Standards – the knowledge and skills that should be mastered in order to achieve a level of proficiency in a particular area. Standards are also a means of setting criteria for accomplishing or judging a particular activity or event. (Council of Chief State School Officers, 2008)

Summary and Organization of Dissertation

The implementation and effective use of technology resources in the K-12 educational environments is essential to provide engaging learning environments for students. Technology standards for administrators and teachers have been developed to guide and support appropriate and effective use of current technologies in schools. To gather perceptions and understanding of technology understanding and use, data were collected in the beginning of the school year through an online survey distributed using the school system email server. The findings document ratings of administrators and teachers on NETS-A and NETS-T standards.

Chapter 1 included the historical overview and background of the study. In addition, the researcher described problem statement and significance of the study and discussed delimitations, limitations, assumptions, and definitions of key terms. A comprehensive review of related literature is in Chapter 2. In Chapter 3, the researcher provides an explanation of the methodology used to collect the data needed to address the research questions. In Chapter 4, the researcher reports the findings, which include perceptions of the teachers and administrators, a comparison of the perceptions, and qualitative findings to support the quantitative data. Chapter 5 provides a discussion of the findings, which includes potential implications for use, recommendations for future studies of teacher and administrator perceptions, and conclusions from the study.

CHAPTER 2: REVIEW OF LITERATURE

Preparing students to function in a globally-competitive world is an important mission of the public education system (USDOE, 2012). Accomplishing it requires school administrators and teachers who are equipped to lead and construct technological changes in their schools and classrooms regarding instructional practices. While studies have explored the role of principals as technology leaders and teachers as facilitators of instruction, few studies have documented their need for purposeful selection of technology training that may lead to changes in leadership and classroom practices. The purpose of the study was to document and compare perceptions of competencies and importance of National Education Technology Standards for Administrators (NETS-A) and National Education Technology Standards for Teachers (NETS-T) as evidence for technology-focused professional development (PD). The need for this continuing research emerged from what is known about educational standards, technology in education, and using national standards to guide change in schools.

Educational Standards

For decades, researchers have investigated factors impacting the use of technology in education. While students and the educational environments in which they learn changed; a need for educational standards reform began. According to Means et al. (1993), states responded to the reform movement with legislative mandates, stricter accountability initiatives, and other changes in policies. The focus of these reforms was

primarily on testing with little to no evidence of change regarding instructional processes. In 1994, President Clinton signed the Goals 2000: Educate America Act (USDOE, 2000), which intended to restore the American education system and elevate American students' global awareness. This act focused on improved learning and teaching by providing a national framework for educational reform with the goal of students, teachers, and administrator using technology in teaching and learning.

More recently, in the United States educational leaders have begun looking into a collaborative effort to resolve educational reform issues. The Common Core State Standards (CCSS) outline the expected knowledge and skills required of K-12 students to meet literacy demands of the 21st century and/or prepare college and career readiness. The Council of Chief State School Officers (CCSSO) and the National Governors Association Center for Best Practices (NGA Center) are two organizations that are driving the Common Core State Standards Initiative (CCSSI) (Drew, 2013). According to leading international organizations (Association of College and Research Libraries, 2000; International Society of Technology in Education, 2007, and Partnership for 21st Century Skills, 2009), the Internet is a dominant text for students and the reading of information on the Internet assists was a problem-solving process. While the federal government is not the force behind the new standards, it leverages the adoption of the standards by offering hundreds of millions of dollars in Race to the Top funds to states that adopt the standards (USDOE, 2012).

By providing an outline, rather than dictating the process the intention of CCSS is to allow states, districts, and teachers to determine the most appropriate pedagogies to impact student learning (Drew, 2013). States are allowed to supplement the CCSS with

an additional 15% of state specific standards. This condition provides opportunities for school districts to work with administrators and teachers collaboratively in an effort to best meet the needs of their particular school populations. Computer based, online assessments are being used to evaluate student learning; therefore educational leaders must ensure students are prepared within digital environments. While Common Core Standards provide focus for administrators and teachers at a national level to improve student success, equally important are global connections. Considering both CCSS and changes in the school environment due to technological advancements, using NETS will assist administrators and educators in making important decisions to guide probable PD.

National Education Technology Standards

Teachers started integrating microcomputers in the K-12 classrooms during the era of *A Nation at Risk* (Alessi & Trollip, 2000; Cradler & Bridgforth, 1996). In an effort to prepare students to be globally competitive, technology standards for teaching and learning were established (Cradler & Bridgforth, 1996). The International Society for Technology in Education (ISTE) has continued to improve teaching and learning at both local and global levels. Leaders from education and businesses along with ISTE and other institutions joined together recommending innovative approaches and broader learning expectations for PK-12 students (Partnership for 21st Century Skills, 2008). The formation of National Technology Standards for Teachers (NETS-T) and students (NETS-S) were established to support these efforts. Additionally, ISTE offers technology support to teachers by providing professional development and technology resources online. Due to exponential growth of technology, members of the Collaborative for Technology

Standards for School Administrators (TSSA, 2001) established a set of standards for school leaders.

National Education Technology Standards for School Administrators (NETS-A)

While standards were in place for teachers and students, a need for guidance for school administrators was additionally evident. Therefore, in February 2002, ISTE adopted the TSSA as the NETS for Administrators (NETS-A). In addition to global connections, the NETS-A and NETS-T clearly align with the five key components of the NETP: learning, teaching, infrastructure, productivity, and assessment. Outlined below are the most current standards of NETS-A (2009):

1. **Visionary Leadership.** This standard encourages administrators to facilitate development of a shared vision to cultivate purposeful change to promote excellence as well as support transformation of the school organization.
2. **Digital Age Learning Culture.** This standard encourages administrators to create, promote, and sustain a dynamic learning environment, which provides rigor and engagement for students.
3. **Excellence in Professional Practice.** This standard encourages administrators to promote an environment that empowers teachers to enhance student learning through use of contemporary technologies.
4. **Systemic Improvement.** This standard encourages administrators to provide digital age leadership and management to continuously improve the organization with technology resources.

5. **Digital Citizenship.** This standard encourages administrators to facilitate and model appropriate ethical and legal issues related to an evolving digital culture.

National Education Technology Standards for Teachers (NETS-T)

As technology advances, it is essential that components of PK-12 education keep pace with the increasing societal needs to prepare students to compete globally. To engage and improve student learning, teachers can use the most current technology standards to guide them as they design, implement, and assess learning experiences by utilizing NETS-T (2008):

1. **Facilitate and Inspire Student Learning and Creativity.** This standard encourages teachers to facilitate learning experiences by using their knowledge of subject matter to advance student learning in face-to-face and virtual environments.
2. **Design and Develop Digital Age Learning Experiences and Assessments.** This standard encourages teachers to create authentic learning experiences that maximize content learning and use contemporary tools and resources to assess student learning.
3. **Model Digital Age Work and Learning.** This standard encourages teachers to use collaborative skills in a digital society to support student learning.
4. **Promote and Model Digital Citizenship and Responsibility.** This standard encourages teachers to understand and exhibit appropriate ethical and legal behavior in an evolving digital culture throughout professional practices.

5. Engage in Professional Growth and Leadership. This standard encourages teachers to continuously improve professional practices by promoting and demonstrating effective use of technology resources and model lifelong learning.

Together the NETS-A and NETS-T provide specific guidance by clearly defining each of the standards for administrators and teachers. If used as intended, NETS provide guidance to assist P-12 teachers in their delivery of instruction as well as leadership for best practices in their professional development growth (ISTE, 2011). The standards provide administrators and teachers with advice regarding essential knowledge and capabilities to effectively lead, guide, and educate students in an increasingly digital world. Familiarity and clarity of the standards is fundamental for successful implementation to occur. Adult learning practices inform trainers that adults learn best on a need-to-know basis; therefore encouraging administrators and teachers to reflect upon understanding and importance of the NETS will provide appropriate direction for improving informed decisions concerning suitable PD training.

Technology in Education

The fact that technology hardware and software have similarly advanced so quickly over the years has made implementation an even greater challenge for policy makers and educators alike. A plan to provide guidance for administrators and teachers on best practices for keeping up with the technological changes was needed. In compliance with the Elementary and Secondary Education Act, in November 2010 the Secretary of the U.S. Department of Education released the Administration's National Education Plan, *Transforming American Education: Learning Powered by Technology*.

The National Education Technology Plan (NETP) encouraged formation of a partnership between K-12 schools and postsecondary education institutions in an effort to decrease student dropout rates. NETP also presented five components with recommendations for the states and additionally defined models of learning that promote personalized learning experience for learners of all ages (USDOE, 2010). The following five key components of NETP align well with the technology standards outlined in NETS: learning, teaching, infrastructure, productivity, and assessment.

In order for American students to compete in the global economy, President Obama's administration positioned education as an urgent priority setting the following two goals: (1) "We will raise the proportion of college graduates from where it now stands (around 41 percent) so that 60 percent of our population holds a two-year or four-year degree by 2020", and (2) "We will close the achievement gap so that all students graduate from high school ready to succeed in college and careers" (USDOE, 2010). To reach the goals, the NETP promotes collaborative efforts from all levels of our education system including states, districts, schools, and the federal government to form partnerships with higher education institutions and non-profit enterprises. Using collaborative support from the NETP, while focusing on the NETS will provide adequate guidance for administrators and educators to appropriately plan for the future direction and effective use of technology in education. Student outcomes are influenced primarily by teachers' classroom instruction; however studies additionally reveal that leadership is the second most important contributing factor to student success (CCSSO, 2008). Therefore teachers and administrators must share a common vision and work together to stay abreast of educational standards as well as current technologies. A comparison

examination between administrators and teachers perceptions and competencies of NETS will provide direction to address technological advancements in schools so that current technologies in schools may be used effectively to impact student learning.

Changing Student Learning

As technology has progressed, students' interactions with the content have also improved. Digital-age learners desire active learning environments that include social, participatory interactions that are supported by media (McLoughlin & Lee, 2010.)

Technological advancements have changed the way students construct knowledge from content:

The world is no longer a dark, unknown place for today's school kids.

Kids are not intellectually empty. Even though some of what they know may be incomplete, biased, or wrong, they arrive at school full of knowledge, thoughts, ideas, and opinions about their world and their universe.

(Prensky, 2008, p. 42)

Teacher beliefs toward technology use can be an obstacle of technology integration (Hermans, Tondeur, Valcke, & Van Braak, 2008; Ertmer & Ottenbreit-Leftwich, 2010). Understanding how to use technology resources effectively may encourage teachers to create lessons that engage students in classroom instruction effectively thus promoting more positive attitudes toward using technology. Using learner-centered teaching has potential to increase K-12 student learning outcomes (Cornelius-White, 2007; Polly, 2008). Today, more than ever, students must self-regulate the learning process. Zimmerman (1989, p. 4) describes self-regulated learning (SRL) as

a process in which learners “are metacognitively, motivationally, and behaviorally active participants in their own learning process.” SRL is a three phase learning process providing learners awareness of their strengths and weaknesses and assists them with regulating goals and strategies (Zimmerman, 2002; 2008). By using suitable technology resources throughout instruction, teachers can provide students with tools to increase motivation and assist with self-regulation of learning. Administrators and teachers need to understand how technology can promote student engagement and improve the current learning environments in which students learn.

Changing School Environment

Arne Duncan, Secretary of the U.S. Department of Education stated, “Over the past 40 years, we have seen unprecedented advances in computing and communication that have led to powerful technology resources and tools for learning (USDOE, 2010). Technology advancements have not only improved the way students learn, but additionally it has continually changed the landscape of school and classroom environments, which radically challenges the abilities of administrators and teachers to keep up. To address these changes, Baylor and Richie (2002) asked, “What actions can school personnel take that most effectively lead to their desired results regarding the integration of technology in schools?” Findings reveal that the level of teacher morale was predicted by two variables: professional development and constructivist use of technology (Baylor and Ritchie, 2002). Teachers are more apt to use technology when they are comfortable with it (Freidus, et al, 2009) and PD will assist to build confidence levels. The selection of technology and media resources for instruction is impacted by

how students learn (Smaldino, Lowther & James, 2012); therefore teachers must be knowledgeable about how technology resources are used properly.

In addition to classroom selection and use of technology, leadership from administration is a very important factor in the effective implementation of technology in schools. Information and communication technologies (ICTs) will be effectively integrated and implemented when school principals support them; learn and use them in their administrative tasks; support their teachers in the process of change; and provide sufficient PD for themselves and their staff (Afshari et al., 2010). Technological advancements have changed the classroom environment and how students learn; therefore it is essential that administrators and teachers focus on educational standards to ensure technological advancements are used appropriately to support effective instruction.

Obstacles to Technology Use in Schools

There is a noticeable gap between the amount of technology available in classrooms and teachers' use of the technology for instructional purposes. For example, less than half of the 3000 teachers surveyed by the National Center for Educational Statistics reported using technology during instructional time (Gray, Thomas, & Lewis, 2010), instead it was used more frequently by teachers for administrative tasks such as recording attendance and grades.

While advancements in technology to support student learning continue to grow, Hew and Brush (2007) identified six main barriers from a review of previous research: (a) resources, (b) knowledge and skills, (c) institution, (d) attitudes and beliefs, (e) assessments, and (f) subject culture. While each of the six barriers identified by Hew and

Brush are essential and relate directly to the NETS-T standards, this study focuses on four of the six identified (i.e., knowledge and skills; institution; attitudes and beliefs; and, assessment). Recognizing the areas in which administrators and teachers need training in these four areas will help to determine suitable professional development to engage students, improve learning environments, promote professional practices in the school community, and evaluate student learning.

Knowledge and skills encompass technology-supported pedagogy as well as technology-related classroom management. This barrier relates directly to NETS-T Standard 3 (Model Digital Age Work and Learning), because without the knowledge and skills teachers cannot model digital-age work (Williams, Coles, Wilson, Richardson, & Tuson, 2000). Using a self-report by teachers to understand areas of needs will help to determine the appropriate PD needs regarding best practices, which in turn may positively impact necessary pedagogical changes.

Institutional barriers include leadership from administration, school timetabling structure, and school planning (Fox & Henry, 2005). Having an administrator that provides leadership will encourage teachers to continuously improve their professional practices of promoting and demonstrating effective use of technology in their schools and professional communities. Understanding perceptions of administrators will assist in the planning of appropriate PD for teachers.

Teacher attitudes and beliefs toward technology are a critical obstacle to technology integration (Hermans, Tondeur, Valcke, & Van Braak, 2008) that relates to all five standards, because teachers are responsible for developing, designing, supporting, and promoting a technology-rich learning environment which provides personalized

learning experiences to meet the diverse learning styles of students. Understanding the competencies of teachers' use of technology will guide toward planning of appropriate PD needs. Training will provide teachers with skills that will positively affect attitudes, which in turn will promote appropriate use of technology integration in the classroom.

Finally, the area of Assessment will be most beneficial to changing current use of technology in schools. Understanding the competencies and perceived levels of importance of NETS technology use between teachers and administrators will assist in determining a basis for plausible PD needs of faculty to support appropriate and effective use of current technologies in schools.

Using The NETS to Guide Change

In order for technology resources to be used by teachers for instructional purposes that impact student learning, it is essential that the barriers be examined closely. Understanding both administrator and teacher competencies and perceptions of NETS will guide the process. With regard to institutional and resource barriers, administrators will benefit by understanding how to appropriately guide teachers to use current technology. In addition the knowledge and skills barrier can be addressed by providing teachers suitable PD opportunities. In this study, the researcher documented and compared administrators' and teachers' perceptions of the NETS-A and NETS-T standards. Technology has changed the way students learn; therefore it is important to gather the perceptions and understanding of technology standards of administrators and teachers to inform appropriate use of technology. Both NETS-A and NETS-T support the significance and importance of PD for administrators and teachers. To address changes in student learning, NETS-A standard 1 describes the need for visionary leadership to

maximize use of digital-age resources by inspiring teachers to transform instructional practices to best meet the needs of learners. Likewise, NETS-T standards 1 and 2 illustrate the importance of teachers inspiring students with innovative instructional methods and assessments by developing and designing technology-enriched learning environments, which promote student reflection and collaboration. To address changes in the school-learning environment due to technological advancements, NETS-A standard 2 describes the importance of administrators creating and sustaining a digital-age learning culture focusing on continual improvement. Similarly, NETS-T standard 3 describes the importance of teachers demonstrating fluency with technology in regard to work processes and effective use of current and emerging digital tools.

Most importantly, both NETS-A and NETS-T address the importance of PD. NETS-A standard 3 states administrators must promote an environment of professional learning and NETS-T standard 5 states teachers must continually improve profession practice and model lifelong learning; therefore PD plays an essential role in empowering administrators and teachers alike. For change to occur, professional development must be an ongoing process. In order to prepare teachers with the necessary skills to effect lasting educational change, educators must collaborate with one another based on common interests and needs (Hargreaves & Goodson, 2006). NETS-T standard 3 depicts the importance of educators modeling digital age work and learning by stating that teachers must collaborate with peer using digital tools to support student success and innovation. Hennessy, et al (2005) recommend that teachers' experiences be valued and acknowledged and suggest that PD should move from focusing on integrating specific ICTs to involving teachers in the process of learning about ICT integration. NETS-A

standard 2 states that administrators must provide learner-centered environments equipped with appropriate resources to meet the needs of diverse learners.

According to Bass and Riggio (2006), as transformational leaders, principals should pay attention to the needs of their staff and be active listeners. Transformational Leadership (Northouse, 2010) supports this finding and further suggests that the leader and followers join together to raise levels of motivation for one another: “Leaders’ thoughts and actions shape the culture of their organizations. Therefore, significant change in an organization begins with significant change in what leaders think, say, and do” (Sparks, 2007, p. 3). Dewey (1916) equally argued benefits to the entire school system would occur when teachers reflect upon practices embedded in the school community. Providing opportunities for teachers and administrators to reflect upon knowledge of NETS in determining technology PD needs will facilitate school leaders and educators collaborative efforts to impact necessary changes within the school environment.

Summary and Focus of Research

Preparing students to work in a globally competitive world requires knowledgeable school administrators and teachers who know how to lead and how to create pedagogical changes. Obstacles such as changing students and continually shifting school environments due to technological advances exist; however using NETS will guide school administrators and teachers to support appropriate and effective use of current technologies in schools. Educational standards can also guide and assist in these efforts. Expected knowledge and skills of K-12 students to meet literacy demands of the

21st century are outlined in CCSS. Additionally important are global connections, which are furthermore addressed in NETS.

Knowledge and skills; institution; attitudes and beliefs; and, assessment toward technology are obstacles of technology integration (Hermans, Tondeur, Valcke, & Van Braak, 2008). As teachers create learning opportunities for students, principal leadership is an important factor effecting integration of technology in the classroom (Afshari et al., 2008); therefore principal perceptions are equally important. Consequently, documenting and evaluating self-reported competency levels and perceptions of importance of technology standards of administrators and teachers is essential. This process will assist in determining plausible professional development needs of school administrators' efforts to lead teacher use of technology resources or on teachers' use of technology to support instruction. Improving student learning is the primary goal of professional development (Yoon et al, 2007); however determining suitable training for administrators and teachers is imperative and will assist in reaching desired educational goals for all students.

The National Technology Plan (2010) presents goals and recommendations supporting teachers attempting to integrate technology in the classroom by defining models of learning, which promote personalized learning experience for students. Using NETS to document and compare competencies and perceptions for administrators and educators assists educational technology professionals in identifying plausible PD needs to support appropriate and effective use of current technologies in schools. Such empirical evidence also supports building an awareness of technology standards for district level personnel, school administrators, and teachers; and provide decision makers with a basis for making informed decisions to improve PD training.

Chapter 2 was a review of the literature, including the formation of the National Educational Standards and proposed a study in which NETS could be used to guide change. In Chapter 3, the researcher will provide an explanation of the research design, a description of the participants and proposed setting, and explanation of the methodology including the instrumentation that will be used to collect the data needed to address the research questions.

CHAPTER 3: METHOD

A mixed-method research design was used to document and compare self-reported competency levels and perceptions of importance of technology standards for administrators and teachers. By collecting both quantitative and qualitative data, the researcher neutralized and balanced the potential disadvantages of using only one data source; thus potentially strengthening the understanding of the data (Creswell et al., 2003). Additionally, the design represented best practice reflected in rationale provided by Rossman and Wilson's (1985) for combining quantitative and qualitative research. First, the combination enabled confirmation and corroboration of each method through triangulation. Second, the combination enabled and developed opportunities for analyses to provide richer data. Third, the combination provided options for initiating new thinking by attending to paradoxes that emerged from two data sources. Outcomes from previous research on the perceptions of the National Education Technology Standards (NETS) of high school principals and teachers have focused on school administrators' efforts to lead teacher use of technology resources or on teachers' use of technology to support instruction. The purpose of this study was to expand previous research by documenting and examining perceptions of elementary and middle public school administrators and teachers to assist educational technology professionals in identifying plausible PD needs to support appropriate and effective use of current technologies in

schools. Details related to research questions, participants and setting, procedure, and design and data analysis are presented in this chapter.

Research Questions

The focus of this research was perceptions of elementary and middle school administrators and teachers. To address the following research questions, the researcher documented and compared self-reported ratings of competence related to and importance of NETS Standards.

1. What are the self-reported competency levels and perceptions of importance of NETS standards for teachers in a large southeastern school district?
2. What are the self-reported competency levels and perceptions of importance of NETS standards for administrators in a large southeastern school district?
3. To what extent are self-reported perceptions of competence and importance of NETS standards similar for administrators and teachers?

Participants and Setting

The participants were 381 (35%) elementary and middle school administrators and teachers from a large school district in a southeastern region of the United States. At the time of the study, the district was: (a) representative of others across the state and nation containing a variety of socioeconomic levels; (b) employed over 2,000 teachers, of which 125 (5%) were Nationally Board Certified; (c) had a strong commitment to technology as evidenced by being ranked 22nd of 115 in the state for its student-to-computer ratio of 1.15 by the Department of Public Instruction; and, was one of the top 5 fastest growing in the state adding approximately 800 students per year. Technology is an

important element of the school system's Strategic Plan, and it is included in the Mission Statement. The system provides a wireless infrastructure district wide and has four elementary schools and one middle school with a 1:1 computer ratio.

An online survey link was sent to 1,116 professionals in the participating district; usable responses ($N = 381$, 35%) were received from teachers ($n = 336$, 88.2%) and administrators ($n = 45$, 11.8%). Participating administrators included employees who were currently working as principals, assistant principals, and/or assistant principals of instruction. Participating teachers included employees who were currently serving as classroom teachers, lead teachers, technology facilitators, media coordinators, and/or special area teachers (i.e., Art, Physical Education, Music). Participation in the study was voluntary and responses were kept confidential.

The following data were collected and used to describe the participants: gender, ethnicity, school level, level of education, number of years of experience, and number of technology professional development trainings the participants attended in the previous school year. Demographic characteristics reported by the respondents are summarized in Table 1.

The sample was predominantly female teachers ($n = 300$, 89.3%) and administrators ($n = 37$, 82.2%) from Caucasian ethnic backgrounds ($n = 313$, 82%). Approximately two thirds of the teacher ($n = 210$, 62.5%) and administrator ($n = 118$, 35.1%) participants were from the elementary school level. The remaining third of the teacher ($n = 118$, 35.1%) and administrator ($n = 15$, 33.3%) participants were from the middle school level. Approximately half of the teachers responding ($n = 174$, 51.8%) had between 0 to 9 years of teaching experience. With regard to advanced degrees,

approximately 40 percent ($n = 184$, 39.5%) of the participants hold either a Masters or a Doctorate degree. Approximately one fourth of the teacher ($n = 83$, 24.7%) and administrator ($n = 12$, 26.7%) participants attended at least two technology professional development trainings in the previous school year.

Table 2 displays availability to home computer by school level of participants. As was expected, almost all ($n = 378$, 99.2%) of the participants had access to a home computer.

TABLE 3.1. Summary of demographic characteristics

Item	Group			
	Teacher		Administrator	
	<i>n</i>	%	<i>n</i>	%
Gender				
Female	300	89.29	37	82.22
Male	36	10.71	8	17.78
Ethnicity				
African American	30	8.93	9	20.00
American Indian	2	.06	1	2.22
Asian	4	.12	0	0
Caucasian	279	83.03	34	75.56
Hispanic	8	.24	0	0
Multi-Race	10	.30	0	0
Other	3	.09	1	2.22
School Level				
Elementary School	210	62.50	30	66.67
Middle School	118	35.12	15	33.33
Other	8	.24	0	0
Level of Education				
Undergraduate	191	56.85	6	13.33
Masters	143	42.56	37	82.22

Item	Group			
	Teacher		Administrator	
	<i>n</i>	%	<i>n</i>	%
Doctorate	2	.06	2	4.44
Years Experience Teaching				
0 - 4	100	29.76	1	2.22
5 - 9	74	22.02	13	28.89
10 - 14	67	19.94	14	31.11
15 - 19	38	11.31	8	17.78
More than 19	47	13.99	9	20.00
N/A	10	.30	0	0
Number of Technology PD trainings last year				
None	66	19.64	4	.89
One	63	18.75	9	20.00
Two	83	24.70	12	26.67
Three	53	15.77	10	22.22
Four or More	71	21.13	10	22.22

TABLE 3.2. Access to home computer

Item	Group			
	Teacher		Administrator	
	<i>n</i>	%	<i>n</i>	%
Access to Home Computer				
No	3	.09	0	0
Yes	333	99.11	45	100

Procedure

To solicit participation by administrators and teachers in accordance with the school district policy, an email request was sent to the Superintendent of Schools (Appendix C). Upon receiving permission from the superintendent, and prior to

beginning the data collection process, the researcher completed and submitted the University Institutional Review Board (IRB) application. Once the IRB approval was confirmed (Appendix D), the researcher continued additional communication with the Superintendent of Schools. A letter was provided to the Superintendent of Schools describing the research and including details about dates the surveys would be conducted, instructions for completing the surveys, and links to the surveys (Appendix E).

Since response rates to online surveys may limit the number of participants and response rate is important, to encourage participation in the study the researcher attended a district level principals' meeting in mid-September to explain the purpose and importance of the study and to provide answers to any questions related to the study. In addition, a letter was sent to participants (Appendix F) explaining that individual responses would not be revealed and thanking participants in advance for agreeing to participate in the study. All participants that completed the survey were entered into a drawing for a \$10 Starbucks gift card (five gift cards were awarded). Participants that agreed and were selected to participate in the follow up interviews were entered into a drawing for a \$50 MasterCard® (two gift cards were awarded). All participants that completed the online survey were provided a six-month subscription to the Simple K12 Teacher Learning Community, which provides up-to-date online, professional development on technology resources for administrators and teachers. The researcher received a return rate of thirty-five percent.

The Superintendent of Schools allowed the researcher to distribute the initial email request to the entire population of middle and elementary administrators and teachers in the district with links to the online surveys notifying participants that the

anonymous surveys would be available for two weeks. At the end of the first week to increase participant levels, a follow-up reminder email (Appendix G) was sent to participants that did not complete the survey at the end of the second week by the researcher via SurveyShare. In order to achieve a more complete understanding of technology competency and perceptions of technology importance, the researcher used convenience sampling (deVaus, 2001) to also conduct semi-structured interviews with administrators and teachers from randomly selected schools.

To complete the survey, participants accessed a SurveyShare hyperlink. The Superintendent of Schools permitted the researcher to distribute the link to participants via the school district's secure email server. To provide confidentiality, participants' school e-mail addresses served as access codes only in the survey data for purposes of monitoring responses and identifying non-responders. SurveyShare did not associate e-mail addresses with individual survey responses so confidentiality was maintained. To provide comprehensiveness, all survey items were required and one open answer item was incorporated to provide participants opportunity to share additional information if desired. The open ended item was not required.

Instrumentation

The researcher collected quantitative (self-report surveys) and qualitative (semi-structured interviews) data. Given that every method of data collection has limitations, the use of multiple methods can balance the weaknesses of using one method with strengths of another (Creswell et al., 2003).

To provide accuracy, feasibility, and determine response rate time, suitable items from the Educational Technology for Principal's Survey (ETPS) (Allen, 2003) and the

Basic Technology Competencies for Educators Inventory (BTCEI) (Flowers & Algozzine, 2000) were revised to create the Technology Survey for Educational Leaders (TSEL) (Appendix H). The TSEL was pilot tested by the researcher and results revealed that the average time to complete the survey was 9 minutes and 1 second, with a standard deviation of 1 minute and 6 seconds. Permission to use the instruments was requested (Appendices I & J). Dr. Allen approved request to use the ETPS (Appendix K) and Drs. Algozzine and Flowers approved use of the BTCEI (Appendix L) to create the TSEL. The ETPS survey used a 5-point Likert scale, whereas the BTCEI survey used a 4-point Likert scale.

The ETPS survey was designed to measure administrators in two areas: the value administrators placed on the standards and their proficiency on the standard. The BTCEI was designed to measure teacher proficiency with technology software and hardware. Both surveys asked respondents to self-report their technology proficiency levels. For example, under the Media Communication category the BTCEI survey asked participants to rank the statements from “Not Competent” to “Very Competent”; while the ETPS asked participants to rank levels of proficiency from “Very Weak” to “Very Strong”. The ETPS survey items were developed using the ISTE NETS-A. Based on a sample of 374 Ohio principals, the Educational Technology for Principals Survey instrument was validated for internal validity and tested for reliability by its developer, Allen (2003). The ETPS survey was sent out to a subset of principals to assess the usability to determine the clarity of the items and report the approximate time to complete the survey (Allen, 2003).

The original BTCEI survey items were developed through consultation of literature, a review of fundamental concepts and skills by professional organizations, and

validated by the authors (Flowers and Algozzine, 2000). BTCEI survey items were revised in 2008 after reviewing updated literature and reviewing current technology standards for teachers established by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and ISTE NETS-T to create the BTCEI-R. The revised survey is not intended to make decisions concerning individual students or teachers; instead survey should be used to assist researchers in the area of educational technology by providing an instrument to measure basic technology competencies for educators.

The ETPS survey items were taken directly from the 2002 version of NETS-A; therefore due to the 2008 revision of NETS-A standards, the researcher used the most current standards to create the TSEL survey items. Design of the TSEL replicates the ETPS format since factor analysis was conducted to determine the construct validity of the instrument and reliability was assessed for internal consistency (Allen, 2003). The new survey was designed for the purpose of collecting information from administrators and teachers related to the 4 research questions. The TSEL is based on the revised NETS-A and NETS-T to gather comparative data as well as provide a more current examination of plausible professional development needs for administrators and teachers.

Administrators and teachers from all middle ($n=5$) and elementary schools ($n=17$) were invited to complete one online, anonymous surveys distributed via the email server. Forty survey items were presented to each participant ($n = 381$). Participants were asked to respond using a four-point Likert scale rating competency from 1 (Not Very Competent) to 4 (Very Competent). Participants additionally rated perceived level of importance using a four-point Likert scale from 1 (Not Very Important) to 4 (Very Important). To document for internal consistency reliability, Cronbach's *alpha* was

obtained. The obtained overall estimate of .98 for importance and for competence ratings for teacher and administrator groups indicated excellent internal consistency.

The initial page of the survey confirmed the survey title and its purpose, provided directions for completion, communicated the anonymous nature of responses, and supplied an estimate of the completion time. The survey was divided into two sections: Demographic items and Perceptions and Competencies of Administrators and Teachers items. Following the initial page of the survey, the Demographics section contained 8 items collecting data regarding: gender, race, school level, school code, highest degree earned, number of years teaching and/or administrative experience, current district position, and number of technology training in-service workshops the participant participated in the previous school year.

The second section contained forty items, which were reflective of five sub-category sections of administrative standards and five sub-category sections of teacher standards. Administrative categories include: Visionary Leadership, Digital Age Learning Culture, Excellence in Professional Practice, Systemic Improvement, and Digital Citizenship. Teacher categories include: Facilitate and Inspire Student Learning and Creativity, Design and Develop Digital Age Learning Experiences & Assessments, Model Digital-Age Work and Learning, Promote and Model Digital Citizenship and Responsibility, and Engage in Professional Growth and Leadership.

Participants were asked to self-report technology competence on four-point Likert type scale (1 = Not Very Competent; 4 = Very Competent) and level of perceived importance (1 = Not Very Important; 4 = Very Important) for all items. The results of the TSEL surveys were used to answer the questions (1) What are the self-reported

competency levels and perceptions of importance of NETS standards for teachers in a large southeastern school district? And (2) What are the self-reported competency levels and perceptions of importance of NETS standards for administrators in a large southeastern school district? The results were also analyzed to compare the two groups and answer the question: (3) To what extent are self-reported perceptions of competence and importance of NETS standards similar for administrators and teachers? The final page of the survey communicated appreciation for completion of the survey, provided the researcher's contact information, and included two open answer items for participants. The first was an optional item in which participants were invited to share additional information to address any respondent questions or concerns. The second was a required item in which participants were asked if they would be willing to participate in a follow-up 5-item semi-structured interview, which would not exceed 30 minutes. Participants willing to assist in a follow up interview were asked to provide a school email address to be placed in a random drawing for selection.

The forty-item TSEL survey section consisted of statements, which alternated between sets of standards for teachers and for administrators. Each standard contained four items. Odd numbered items addressed administrator standards (NETS-A), while even numbered items addressed teacher standards (NETS-T). Participants were not aware of which items represented the administrator or teacher standards and were directed to read and reflect on all items in the same manner. The Items Standard Matrix (Appendix M) illustrates the relationships between the survey items and the National Education Technology Standards (NETS) for administrators and teachers and denotes the specific statements used to address each standard.

To obtain a clearer understanding of competency and perceived level of importance for each standard, the four survey items were grouped together for analysis purposes and reviewed as one standard. For example, item numbers 1, 3, 5, and 7 were combined to represent NETS-A Standard 1; while item numbers, 2, 4, 6, and 8 were combined to represent NETS-T Standard 1. For each item, participants rated both Competency (c) and Perceived Importance (i).

Interview. To achieve additional understanding of administrators' and teachers' perceptions, the researcher randomly selected names from a pool of email addresses of interested participants. To determine the participants who would be interviewed, two administrators were selected, one from an elementary administrator pool of email addresses and one from a middle school administrator pool of email addresses. Four teachers were selected. Two teacher names were randomly selected from the elementary pool of email addresses, and two were randomly selected from the middle school pool of email addresses. Participants were contacted by initially by email and/or phone. (Appendix N) No follow-up procedures were necessary. The optional, open item from the survey was also used to examine perceptions of administrators and teachers.

Survey. The survey was comprised of two sections. Section one contained ten demographic items. Demographic information included: gender (male, female), ethnicity (African American, American Indian, Asian, Caucasian, Hispanic, Multi-Race, other), school level (Elementary, Middle, Other), level of education (Undergraduate, Masters, Doctorate), years of experience (0-4, 5-9, 10-14, 15-19, More than 19, N/A), number of technology PD trainings attended last year (None, One, Two, Three, Four or More).

Section two contained forty items that were sub-divided into four statements in which participants reviewed and rated levels of importance and ratings of competency. Twenty items depicted administrator standards and twenty items depicted teacher standards. A four point Likert scale was used for each rating in compliance with the permission rights granted from Dr. Robert Algozzine for use of the BTCEI Survey. Levels of Importance was rated on a 4-point scale from low - high [NVI-Not Very Important] [SI-Somewhat Important] [I-Important] or [VI-Very Important]. Levels of Competence was rated on a 4-point scale from low - high [NVC-Not Very Competent] [SC-Somewhat Competent] [C-Competent] or [VC-Very Competent].

Five dependent variables were used for administrator standards and five dependent variables were used for teacher standards. Administrator variables included: Visionary Leadership, Digital Age Learning Culture, Excellence in Professional Practice, Systemic Improvement, and Digital Citizenship. Teacher variables included: Student Learning and Creativity, Digital Age Learning Experiences and Assessments, Digital Age Work and Learning, Digital Citizenship and Responsibility, and Professional Growth and Leadership.

Interview. The researcher conducted semi-structured phone interviews with the two principals and four teachers. After conducting interviews with the principals, the researcher interviewed the teachers. Participants who were selected for the semi-structured interviews were provided pseudo-names to protect the identity of principals and teachers participating in the interviews; therefore the data does not reveal the participants' identities and responses do not associate with the interviewees in the reports.

In addition, the data collected was coded by participants' categories (elementary / middle school; administrator / teacher) only identifiable to the research team.

The Technology Interview for Educational Leaders (TIEL) (Appendix O) was conducted via a telephone call to each of the school sites. The interviews were used to validate an understanding of each participant's competency and perceived level of importance of the NETS standards. Participants were located in a quiet, private location (office or classroom) agreeable to both the participant and researcher, which reduced background noises and or potential distractions of the participants. The researcher was located at a private home office, which provided a quiet, secure environment conducive for audio recording via a speakerphone during each interview. To ensure comfort level and confidentiality of the participants, the researcher used a home office, which allowed participants to answer interview items without fear of being overheard by others.

Interview questions are comparable to the items from the survey and were used to provide additional explanation of the perception and understanding findings as well as add to the credibility of the study by clarifying ambiguities from the quantitative data. The technology standards for administrators and teachers are sub-divided into 5 categories. The researcher read each category one at a time and asked the participants to reflect on each and share a personal behavior or practice that they currently used in their classroom or school which exhibits or models the behavior and would 'fit' the category. Participants were also asked to rank their competence level and perceived importance levels on a 4-point Likert scale [low 1- 4 high] for each category.

Participants were interviewed individually and answered five questions, one from each of the five categories, on the standards related to their current role (administrator or

teacher.) Interviews ended with an open item question that invited participants to share any additional information to help me understand the participant's technology competency and/or perceived importance of technology. All interviews were recorded to ensure accuracy of the data. Audio recordings from interviews were collected on a iPad using iRecorder software with a security password. The iPad was stored in a locked up file cabinet when not being used to record/collect interviews. Recordings were reviewed privately and transcribed by the researcher in a private home office immediately following each interview. The transcriptions were reviewed two days after each interview to ensure accuracy of the transcriptions. Summaries of the findings were shared with the participants to ensure accuracy of the transcription and interpretation. All audio recordings were destroyed within two weeks of recording. Recordings were deleted from the iPad. Responses were recorded and coded to look for themes regarding similarities and differences in perceptions and competencies of administrators and teachers compared to the findings from the online anonymous surveys.

Administrators and teachers completed the same online survey; however since the NETS standards differ for administrators and teachers, a different set of interview items was necessary for each group. Both the administrators and the teachers were provided six interview items, one to represent each of the five standards and one open ended item. Since semi-structured interviews were used and competencies of participants ranged significantly, interviewee responses varied in length from participant to participant. Ratings from the surveys, opinions from the open-ended question item, and semi-structured interviews were used to determine competency levels and perceptions of importance of NETS respectfully.

Design and Data Analysis

The mixed-method design of simultaneously collecting and analyzing both quantitative and qualitative data described by Creswell (2005) was used to increase validity of the findings. The concurrent triangulation design by Creswell et al. (2003) uses separate quantitative and qualitative methods to confirm and cross-validate the study's findings. Principals and teachers each completed one anonymous survey. Semi-structured interviews were conducted with principals and teachers from select schools to triangulate findings of self-reporting surveys regarding competency and perception of importance of NETS.

Descriptive (Research Questions 1 and 2) and inferential (Research Question 3) statistical analyses were performed in IBM® SPSS® (IBM, 2012) computer software. Means and standard deviations for individual items and clusters of items were reported to document the self-reported competency levels and perceptions of importance of NETS standards for teachers and administrators. Group inferential analyses (*t*-tests and 95% confidence intervals) were used to evaluate the extent to which statistically significant differences were evident between and within groups of administrators and teachers. A confidence level of .95 was set. Qualitative analyses of surveys and semi-structured interview responses were completed to provide additional evidence of similarities and differences in perceptions and competence and importance of NETS standards for administrators and teachers. The constant comparative method process was used to compare the quantitative (survey) results to the qualitative (interview) data. The survey data were collected first. Next, the researcher interviewed and transcribed each interview. Open coding was used to review the interview contents. The researcher asked questions

and made comparisons with the data to look for similarities and differences to corroborate or refute findings.

The responses from the online survey were exported from the SurveyShare and imported into a word processing document. To examine and interpret the data, the researcher used the open coding process. All responses were analyzed and coded by the researcher. The researcher read over the comments to obtain a general idea of the content, looked for patterns, made comparisons, looked for similarities and differences in the statements, and categorized the comments into themes. Next, the researcher reviewed the transcribed semi-structure interview items. Once again, the researcher analyzed statements and coded statements into themes. The researcher determined that seven themes of equity, funding, leadership, pedagogy, professional development, support, and time were clearly evident in both the open-ended survey item and throughout the responses to the semi-structured interview items. Findings of the study were shared with the Superintendent with all school and/or personal identifying data removed.

Summary

In Chapter 3, the researcher described the method with information about the participants, procedure and instrumentation, and design and data analysis of the study. The study documents and compares self-reported perceptions of competence and importance of technology standards of middle and elementary school principals in a large school district in a southeastern region of the United States. The study is a mixed-method design, which collected both qualitative and quantitative data to increase validity of the findings. Group descriptive and inferential statistics were used to document and compare the similarities and differences in perceptions of teachers and administrators. In Chapter

IV of the dissertation, the researcher reports the findings of the study. In Chapter V of the dissertation, the researcher provides a summary and discussion including limitations, practical implication for the improvement of practice and future research and conclusions.

CHAPTER 4: RESULTS

Chapter 1 included the introduction, statement of the problems, purpose of the study and significance of this research and the background and need for the research was described in Chapter 2. A mixed-method research design was used to document and compare self-reported competency levels and perceptions of importance of technology standards for principals and teachers. Quantitative findings addressing each research question are presented in this chapter followed by a summary of the outcomes of qualitative analyses.

The researcher was interested in documenting and comparing self-reported perceptions of competencies related to and the importance of National Technology Standards (NETS). Means, standard deviations, and comparison statistics for teachers' and administrators' competence ratings of NETS-A and NETS-T standards are in Table 4.1. Means, standard deviations, and comparison statistics for teachers' and administrators' ratings of importance of NETS-A and NETS-T standards are in Table 4.2.

Perceptions of Teachers

Teacher ratings of competence (see Table 4.1) varied slightly (*Range* = 2.60-2.82) on the NETS-A standards. Teachers rated themselves more competent ($M = 2.81$; $M = 2.82$) on standards that dealt with Digital Age Learning Culture (Standard 2) and Digital Citizenship (Standard 5). Teachers rated themselves less competent ($M = 2.60$; $M = 2.64$) on Visionary Leadership (Standard 1) and Systemic Improvement (Standard 4). Patterns

of perception were similar for importance ratings (see Table 4.2). For example, teachers rated importance higher ($M = 3.39$; $M = 3.37$) on Standards 2 and 5 and they rated importance lower ($M = 3.24$) for Visionary Leadership (Standard 1) and Systemic Improvement (Standard 4).

Review of teacher ratings of competence (see Table 4.1) on the NETS-T standards revealed similar variation ($Range = 2.62$ - 2.82). Teachers rated their competence higher ($M = 2.82$; $M = 2.79$) on the standards that dealt with Facilitating and Inspiring Student Learning and Creativity (Standard 1) and Promoting and Modeling Digital Citizenship and Responsibility (Standard 4). Teachers rated their competency lower ($M = 2.62$; $M = 2.70$; $M = 2.71$) on standards that dealt with Engaging in Professional Growth and Leadership (Standard 5), Modeling Digital Age Work and Learning (Standard 3) and Designing and Developing Digital Age Learning Experiences and Assessments (Standard 2). Teacher perceptions of importance (see Table 4.2) were higher ($M = 3.42$; $M = 3.37$; $M = 3.37$) on standards in which they rated their competence higher (Standards 1, 2, and 4). Teacher perceptions of importance were lower ($M = 3.21$, $M = 3.26$) on the standards that dealt with Engaging in Professional Growth and Leadership (Standard 5) and Modeling Digital Age Work and Learning (Standard 3).

Teachers tended to rate their competence higher on standards that they perceived were more important. Relationships between ratings of competence and importance were moderate across NETS-A ($r = .28$ -. 45) and NET-T ($r = .29$ -. 46) Standards (see Table 4.3).

Perceptions of Administrators

Administrators' ratings of competence (see Table 4.1) varied slightly (*Range* = 2.89-3.10) on the NETS-A Standards. Administrators rated themselves more competent ($M = 3.10$; $M = 3.09$) on standards that dealt with Digital Citizenship (Standard 5) and Digital Age Learning Culture (Standard 2). Administrators rated themselves less competent ($M = 2.89$; $M = 2.90$) on Systemic Improvement (Standard 4) and Visionary Leadership (Standard 1). Patterns of perception were similar for importance ratings (see Table 4.2). For example, administrators rated importance higher ($M = 3.67$; $M = 3.68$) on Standards 2 and 5 and they rated importance lower ($M = 3.54$; $M = 3.59$; $M = 3.60$) for Visionary Leadership (Standard 1), Systemic Improvement (Standard 4), and Excellence in Professional Practice (Standard 3).

Review of administrators ratings of competence (see Table 4.1) on the NETS-T standards revealed similar variation (*Range* = 2.85-3.00). Administrators rated their competence higher ($M = 3.00$; $M = 2.97$) on the standards that dealt with Facilitating and Inspiring Student Learning and Creativity (Standard 1) and Promoting and Modeling Digital Citizenship and Responsibility (Standard 4). Administrators rated their competency lower ($M = 2.85$; $M = 2.90$; $M = 2.92$) on standards that dealt with Engaging in Professional Growth and Leadership (Standard 5), Modeling Digital Age Work and Learning (Standard 3) and Designing and Developing Digital Age Learning Experiences and Assessments (Standard 2). Administrator perceptions of importance on the NETS-T (see Table 4.2) were higher ($M = 3.74$; $M = 3.69$; $M = 3.66$; $M = 3.62$) on standards in which they rated their competence higher (Standards 1, 2, 3, and 4). Administrator

perceptions of importance were lower ($M = 3.52$) on the standards that dealt with Engaging in Professional Growth and Leadership (Standard 5).

Administrators tended to rate their competence higher on standards that they perceived were more important. Relationships between ratings of competence and importance were moderate across NETS-A ($r = .28$ -.50) and NET-T ($r = .24$ -.50) Standards (see Table 4.3).

Comparison of Teacher and Administrator Perceptions

Comparison statistics for teachers' and administrators' competence ratings on NETS Standards are displayed in Table 4.1. Administrators' ratings were statistically significantly higher than teachers on the NETS-A Standards but not on the NETS-T Standards. Comparison statistics for teachers' and administrators' importance ratings on NETS Standards are displayed in Table 4.2. Administrators' ratings were statistically significantly higher than teachers on both the NETS-A and the NETS-T Standards.

Table 4.1. Means, standard deviations, and comparison statistics for competence ratings of NETS Standards

Standard	Teachers		Administrators		diff	95% CI	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		LL	UL
NETS-A							
1. Visionary Leadership	2.60	0.68	2.90	0.56	0.30	0.51	0.09
2. Digital Age Learning Culture	2.81	0.69	3.09	0.63	0.27	0.48	0.05
3. Excellence in Professional Practice	2.69	0.72	2.96	0.67	0.26	0.48	0.04

Table 4.1: (Continued)	Teachers		Administrators		diff	95% CI	
	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>		LL	UL
4. Systemic Improvement	2.64	0.71	2.89	0.65	0.24	0.46	0.02
5. Digital Citizenship	2.82	0.69	3.10	0.54	0.27	0.48	0.06
NETS-T							
1. Facilitate and Inspire Student Learning and Creativity	2.82	.67	3.00	.65	0.18	0.38	-0.04
2. Design and Develop Digital Age Learning Experiences and Assessments	2.71	.72	2.92	.66	0.21	0.43	-0.02
3. Model Digital Age Work and Learning	2.70	.72	2.90	.67	0.20	0.44	-0.01
4. Promote and Model Digital Citizenship and Responsibility	2.79	.68	2.97	.63	0.16	0.38	-0.04
5. Engage in Professional Growth and Leadership	2.62	.76	2.85	.75	0.23	0.46	-0.01

Note. Difference is practically significant if 95% CI does not contain 0.0.

Table 4.2: Means, standard deviations, and comparison statistics for importance ratings of NETS Standards

Standard	Teachers		Administrators		diff	95% CI	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		LL	UL
NETS-A							
1. Visionary Leadership	3.24	0.52	3.54	0.41	0.30	0.46	0.14
2. Digital Age Learning Culture	3.39	0.59	3.67	0.41	0.28	0.46	0.11
3. Excellence in Professional Practice	3.27	0.58	3.60	0.44	0.33	0.51	0.15
4. Systemic Improvement	3.24	0.58	3.59	0.44	0.35	0.53	0.18
5. Digital Citizenship	3.37	0.58	3.68	0.41	0.31	0.47	0.13
NETS-T							
1. Facilitate and Inspire Student Learning and Creativity	3.42	0.53	3.74	0.35	0.32	0.49	0.17
2. Design and Develop Digital Age Learning Experiences and Assessments	3.38	0.57	3.69	0.37	0.31	0.49	0.15
3. Model Digital Age Work and Learning	3.26	0.59	3.62	0.46	0.36	0.54	0.19
4. Promote and Model Digital Citizenship and Responsibility	3.37	0.56	3.66	0.42	0.29	0.46	0.12
5. Engage in Professional Growth and Leadership	3.21	0.59	3.52	0.53	0.31	0.48	0.13

Note. Difference is practically significant if 95% CI does not contain 0.0.

Table 4.3. Correlations between ratings of competence and importance across standards

Standard	Group	
	Teacher	Administrator
NETS-A		
1. Visionary Leadership	.38	.28
2. Digital Age Learning Culture	.45	.50
3. Excellence in Professional Practice	.35	.47
4. Systemic Improvement	.28	.49
5. Digital Citizenship	.36	.42
NETS-T		
1. Facilitate and Inspire Student Learning and Creativity	.46	.24
2. Design and Develop Digital Age Learning Experiences and Assessments	.39	.25
3. Model Digital Age Work and Learning	.35	.36
4. Promote and Model Digital Citizenship and Responsibility	.36	.45
5. Engage in Professional Growth and Leadership	.29	.50

Qualitative Findings

To address the perceptions of importance and competencies of the standards, the researcher examined comments from the optional open-ended survey item on the TSEL and responses to the semi-structured interview questions and open-ended item on the TIEL. While respondents were provided an opportunity to share any additional information or concerns about technology by responding to an open item question at the conclusion of both the survey and the semi-structured interview, the majority opted out of sharing. A smaller percentage of survey participants ($n = 46$, 12%) chose to provide additional information; compared to half ($n = 3$, 50%) of the participants from the semi-structured interview. Qualitative findings from the online survey are displayed in Table 4.4. Items from the semi-structured TIEL interviews were additionally used to look for these themes. Qualitative findings from the interviews are displayed in Table 4.5.

At the end of the TSEL, participants were invited to share feelings regarding technology in general by responding to an open-ended item that stated, "Please use the space below to share any additional information or address any concerns you may have at this time." Using this process, I was able to obtain perceptions from the participants that were not evident from the Likert scale item analysis. This open-ended item was not required since the TIEL also concluded in an optional open-ended item to obtain additional perceptions. While some responses from participants discussed concerns about equity, time, and funding, the majority of participants used the space to discuss concerns about technology professional development.

The following responses support the need for PD opportunities as well as the importance of collaborative effort between teachers and administrators. Teachers tended

to be more vocal about PD than administrators. Only two school administrators responded to the open-ended item.

Teacher responses:

“Technology is forever evolving. Teachers need constant professional development to keep up. If teachers are expected to use more technology, administration should probably consider that there is a desire to do more but there is no time available in the normal schedule to learn how.”

Elementary teacher

“The items in this survey have grown in importance in the last 4 years of my teaching experience. I have been in the same school for the last 4 years. At the beginning of that the importance and competence of these items would have all been low. I foresee that we will continue to see growing competency and importance of these items.”

Elementary teacher

“Train teachers on the basic use of Mac computers and apple products so it will be easier to implement the technology from day one. Many teachers don't utilize technology for a lack of understanding how to operate the tools themselves. Technology training should be part of new teacher orientation.”

Elementary teacher

“I think technology is a great tool, if showed how to use it properly.”

Elementary Special Area teacher

“It's difficult to promote what one knows is best when one lacks the social power to promote those beliefs.”

Elementary Special Area teacher

“How to keep up with rapid changes in technology.”

Elementary teacher

“I feel that present teaching conditions don't truly allow for the creativity and use of technology in all the ways it could. Especially at the elementary level it seems that since the Core Curriculum Standards have come into play that teachers are just trying to stuff the kids with information to pass tests. I don't see a lot of real learning, even with all the technology in our schools, happening.”

Elementary teacher

“I would love to bring more communication through digital means.”

Elementary teacher

“It is important for a school/school system to provide adequate training and get out as many bloopers as possible BEFORE implementing new technologies. It is also important to maintain and update the technology a school has BEFORE adding new things.”

Middle School Special Area teacher

“Need more training on technology.”

Middle School teacher

“I don't know what is expected of me in the classroom with my use of technology in my lessons.”

Middle School teacher

“A lot of times, we are introduced to ideas, but do not receive follow-up to assist when we go back into the classrooms. Getting an introduction and receiving screen shots is not helpful to different types of learners. I am terrified of technology, but I want my students to have the advantages technology brings, so I go out of my comfort zone. I just don't utilize the technology to its fullest. I want to!!”

Middle School teacher

“I would like to be a part of any professional development I can on technology.”

Middle School teacher

Administrator responses:

“No additional comments at this time-I would like additional opportunities to grow in the area of technology as an administrator.”

Elementary Principal

“At our school technology is key and essential to our daily instruction.”

Middle school Assistant Principal

Through data analysis the researcher defined seven themes contained in the responses from the open-ended items on survey and semi-structured interviews. Themes include: equity, funding, leadership, pedagogy, professional development, support, and time. Leadership, pedagogy, and professional development are three themes that emerged which are directly related to NETS. While equity, funding, support, and time are not

evident in the standards; many participants expressed concern with equity and support. In sharing concerns, one third of the participants from the both survey ($n = 15$, 32.6%) and semi-structured interviews ($n = 1$, 33.3%) discussed the issue of equity of resources.

While no participants from the semi-structured interview shared need for support in the open-ended item area, 17.3% of the respondents from the online survey discussed the importance of having technical support at the building level. A little less than one-fourth ($n = 11$, 23.9%) of the online survey participants mentioned the importance of needs for professional development opportunities.

The researcher reviewed individual responses from administrators and teachers to survey items on the TSEL. Individual responses were examined and coded by the researcher to further investigate the seven identified themes. Once again, the theme of equity emerged. Table 4.3 displays the number of participants whose responses fit the themes on the open-ended item on the survey and semi-structured interviews. One hundred percent of the administrators mentioned six of the seven themes in interviews. The themes of equity, pedagogy, and professional development were mentioned by one hundred percent of the teachers. The theme of time was not evident in either administrator or teacher responses. The researcher additionally reviewed the individual responses from administrators and teachers on the five semi-structured interview items. Table 4.4 displays the number of participants whose responses fit the themes.

Table 4.4. Themes of open ended items of survey and interview

Themes	Open Ended Item			
	Survey		Interview	
	<i>n</i>	%	<i>n</i>	%
Equity	15	33	1	33
Funding	3	0	1	33
Leadership	1	0	0	0
Pedagogy	5	11	1	33
Professional Development	11	24	0	0
Support	8	17	0	0
Time	3	0	0	0

Table 4.5. Themes of interview items TIEL Interview

NETS Standards	Interview Items from TIEL			
	NETS-A		NETS-T	
	<i>n</i>	%	<i>n</i>	%
Equity	2	100	4	100
Funding	2	100	2	50
Leadership	2	100	3	75
Pedagogy	2	100	4	100
Professional Development	2	100	4	100
Support	2	100	1	25
Time	0	0	0	0

Comments and responses were used to corroborate and refute findings from the quantitative data. Both the survey and the interview data depict similar participants' views pedagogy importance. The survey found no statistical difference in NETS-T

Standards 1 (facilitating and inspiring student learning) and 2 (designing and developing digital age learning experiences). Additionally, all participants ($n = 8$, 100%) from the semi-structured interviews discussed the importance of pedagogy when utilizing technology. While results of the online survey reveal that both groups rated the importance of engaging in Professional Growth (NETS-T, Standard 5) and Visionary Leadership (NETS-A, Standard 1) low, the semi-structure interview data depict the contrary. All administrators ($n = 2$, 100%) and teachers ($n = 6$, 100%) shared concerns about the need for professional development. Additionally, the majority of participants ($n = 7$, 88%) expressed an importance for the need of school and/or district leadership.

CHAPTER 5: DISCUSSION

The purpose of this study was to document and compare self-reported levels of competence and importance of technology standards for principals and teachers to assist educational technology professionals in identifying plausible PD needs to support appropriate and effective use of current technologies in schools. The researcher anticipates that findings from the study will also provide decision makers with a basis for making informed plans to improve PD training by supporting building an awareness of technology standards for district level personnel, school administrators, and teachers.

In the first chapter, the researcher provided the introduction, statement of the problems, purpose of the study and significance of the research. In Chapter 2, the researcher provided a review of the literature, including the formation of the National Educational Standards and proposed a study in which NETS could be used to guide change. In Chapter 3, the researcher described the method including information about the participants, procedure and instrumentation, and design and data analysis of the study. In Chapter 4, the researcher reported the findings of the study including comparisons of the administrators and teachers with regard to perceived competence and importance of the National Education Technology Standards for teachers and administrators. In this chapter, the researcher presents an analysis of the finding in relation to prior knowledge, implications for improvement of practice, limitations of the study, recommendations for future research and conclusions.

Analysis of the Findings

Previous research on the perceptions of the National Education Technology Standards (NETS) focused on the role and efforts of high school principals as technology leaders to lead teacher use of technology resources or on teachers' use of technology to support instruction. Data from this study concur with findings from Allen (2003) of high school administrators' perceptions. There was a statistically significant difference in importance and competency ratings of elementary and middle school administrators on the NETS-A standards. Additionally, Allen (2003) concluded that principals' responses to proficiency were always rated lower than their responses to the corresponding importance on the items. This study reveals similar findings. Administrators consistently rated their competency lower than their responses to corresponding importance on all of the NETS-A standards. This difference suggests that administrators have a need for PD on each standard.

Teachers' classroom instruction influences student outcomes (CCSSO, 2008); therefore it is also important to understand the perceptions of teachers. This study added to the work of Flowers and Algozzine (2000) by developing the TSEL and TIEL instruments to assist school districts with understanding the perceptions on NETS of teachers in the field. Data reveal that teachers consistently rated their competency lower than their responses to corresponding importance on all of the NETS-T standards. This difference suggests that teachers have a need for PD on each standard especially since they are less likely to implement the use of technology if they do not feel competent.

While studies have explored the role of principals as technology leaders and teachers as facilitators of instruction, this study documents the need for purposeful

selection of technology training that will lead to change in leadership as well as classroom practices. For change to occur, professional development must be an ongoing process. To prepare teachers with the necessary skills to effect lasting educational change, educators must collaborate with one another based on common interests and needs (Hargreaves & Goodson, 2006). The data suggest that both teachers and administrators tended to rate their competence higher on standards they perceived more important; therefore perceptions can assist in determining PD choices. Understanding how to use technology resources effectively may encourage teachers to create lessons to engage students effectively (Cornelius-White, 2007). Teachers must be knowledgeable about using technology resources for instruction properly because it impacts how students learn (Mishra & Koehler, 2006; Smaldino, Lowther & James, 2012).

The level of teacher morale can be predicted by two variables: professional development and constructivist use of technology (Baylor & Richeic, 2002). Teacher beliefs toward technology use can be an obstacle of technology integration (Hermans, Tondeur, Valcke, & Van Braak, 2008); therefore understanding teacher perceptions will assist in determining PD needs. Teachers are more apt to use technology when they are comfortable with it (Freidus, et al, 2009). If used as intended, NETS provide guidance to assist P-12 teachers in their delivery of instruction as well as leadership for best practices in their professional development growth (ISTE, 2011). Earlier studies used the ISTE 2000 standards, which were revised in 2007 and 2008. This study expands upon previous research by documenting and examining perceptions of elementary and middle public school principals and teachers on the most current NETS standards.

The framework of the National Educational Technology Standards for Administrators (NETS-A) and Teachers (NETS-T) from the International Society for Technology in Education (ISTE) was used in the creation of the Technology Survey for Educational Leaders (TSEL) to assist in gathering the self-reported perceptions of competencies and the importance of NETS. Additionally, semi-structured interviews were conducted to corroborate and refute findings from the quantitative data. The research questions that guided this study were: (1) What are teachers' self-reported perceptions of competence and importance for NETS Standards in a large southeastern school district? (2) What are administrators self-reported perceptions of competence and importance for NETS Standards in a large southeastern school district? (3) To what extent are self-reported levels of competence and importance of NETS standards similar for administrators and teachers? The findings have value in assisting educational technology professionals in identifying plausible PD needs to support appropriate and effective use of current technologies in schools.

Survey data gathered self-reports for both NETS-A and NETS-T from all participants. Data revealed that both the administrators and teachers self-reported competencies higher on standards that they perceived as more important and lower on those perceived as less important. Correlations between ratings of competence and importance across standards were moderate across NETS-A and NETS-T for both groups. Teachers rated competency lowest in Visionary Leadership (NETS-A, Standard 1) and Administrators rated competency lowest in Systematic Improvement (NETS-A, Standard 4). A contrast in beliefs was revealed for Engaging in Professional Growth and

Leadership (NETS-T, Standard 5). Teachers rated this standard the lowest; while administrators rated it the highest.

The responses to the open-ended items on survey and semi-structured interviews enabled the researcher to examine and compare data to determine seven themes. The seven themes that emerged were: equity, funding, leadership, pedagogy, professional development, support, and time. The three themes that emerged which are directly related to NETS are leadership, pedagogy, and professional development. Although equity, funding, support, and time are not evident in the standards; many participants expressed concern with equity and support. Data from the semi-structured interviews determined that equity of resources was a concern for one third of the respondents. In order for technology resources to be utilized, technology must be in place. More importantly, while professional development was rated lowest in importance approximately one-fourth ($n = 11, 23.9\%$) of the online survey participants mentioned the importance of needs for professional development opportunities in the open-ended area of the survey. All participants mentioned the importance and need for professional development in the semi-structured interviews.

Implications for Improvement of Practice

The results of this study have significant implications for a variety of stakeholders, including state and school district office professional development leaders as well as school building level administrators and teachers. Additionally, university preparation programs of school administrators and teachers may benefit. Teachers and administrators must share a common vision and work together to stay abreast of educational standards as well as current technologies. This study demonstrates how

administrators and teachers can provide insight into how perceptions of importance can influence professional development selection. Documenting and evaluating self-reported competency levels and perceptions of importance of National Technology Standards (NETS) of faculty is essential. This process can assist in determining plausible Professional Development needs of school administrators' efforts to lead teacher use of technology resources and with teachers' effective use of technology to support instruction.

Three broad themes that emerged from the qualitative and quantitative data of the study are: leadership, pedagogy, and professional development. The mission of ISTE is to “empower learners to flourish in a connected world by cultivating a passionate professional learning community, linking educators and partners, leveraging knowledge and expertise, advocating for strategic policies, and continually improving learning and teaching (ISTE, 2013).” ISTE developed the NETS-A and NETS-T to evaluate and guide school systems and leaders with decision-making. The administrators and teachers that participated in this study self-reported competencies and perceived levels of importance of the standards via a survey. The results of the survey indicated that both administrators and teachers reported the highest competencies in areas where perceptions of importance were high. Based on these findings, it is particularly important to afford ongoing technology PD to administrators and teachers. Participants rated competencies lowest in leadership and professional development; therefore continual opportunities for staff development are essential for growth. It is essential for district leaders to determine appropriate PD needs for administrators and teachers and not use a one size fits all training model. Educational technology training opportunities should include school

administrators and teachers participating together within their school environment utilizing the resources they have available within their building and/or classrooms.

Limitations

The data were collected using a self-reporting of technology competence and importance of both the NETS-A and NETS-T. Surveying teachers and administrators via self-reporting can potentially yield inaccurate data. The time of the day the participants took the survey could affect their responses. Teachers and administrators who volunteered to participate in a semi-structured interview may potentially be more interested in technology than participants that chose not to participate. This may have contributed to a collection of skewed qualitative data. Another limitation is that the experienced participants with advanced degrees were more technology savvy than those that were less experienced or did not have advanced degrees. Confounding variables include, but are not limited to the following: Access to technology where participants teach, factors in participants' lives other than those reviewed in the study could be contributing to the understanding of the national technology standards. Participants may have varying levels of professional development in regard to NETS-A and NETS-T.

Recommendations for Future Studies

This study used a mixed-method design to document and compare perceptions of North Carolina elementary and middle school principals and teachers from a large school district on 2009 ISTE NETS-A and 2008 NETS-T as they were the most recent standards at the time of the data collection. ISTE has since changed the names of the standards from NETS-A, to ISTE Standards for Administrators (ISTE Standards-A) and from NETS-T, to ISTE Standards for Teachers (ISTE Standards-T); however the standards

themselves were not changed from those used in this study. The researcher used descriptive statistics to document perceived competence and importance and inferential analyses to compare the similarities and differences in perceptions of teachers and administrators. Data were collected in a school system; and, elementary and middle schools were compiled together. If this study was to be replicated, it is recommended that data be collected in a nested form and the use of the Hierarchical Linear Model be implemented to determine potential impact administrators' perceptions have on the teachers within each school. Additionally, it would be interesting to look at the needs of teachers within an individual school district. This study could be replicated by states to look at multiple school districts within the state.

Although the study collected demographic information from the respondents, these data were not utilized in the statistical analysis. Further studies should use demographic data such as years of administrative experience and/or teaching experience as predictor variables. Technology facilitators, media coordinators, and coaches were included in the teacher data. This group could be separated and the ISTE, Standards for Coaches (NETS-C), could be used for that sub-group. These data may additionally assist in determining other variables that may impact ratings on competency and perceived levels of importance. This study could also be replicated in school districts in other states.

Conclusion

To affect long-term, systemic change the professional development must be designed to address the needs of the individuals within the context of their educational setting (Wells, 2007). This study surveyed and interviewed middle and elementary administrators and teachers in a large school district in the southeastern United States to

identify plausible Professional Development needs of staff to support appropriate and effective use of technology resources currently in their school district. School districts that applied for and received Race to the Top dollars, should review how their state used the monies that were allocated for PD. Many school systems, including the one investigated in this study, invested those monies for technologies to provide teachers, principals, and administrators the support necessary to make continuous instructional improvements; therefore resources may be readily available at the district and/or state level to implement PD needs immediately.

Teacher use of new technology increases when administrators model the use of technology and provide leadership and support (Afshari, et. al, 2010); therefore comparing the competencies and perceived importance of the NETS of administrators and teachers is essential. Findings from this study are consistent with those of other PD researchers. Data reveal while teachers saw an importance in learning how to design and develop learning experiences, they rated competency low in this area, which helps to determine a common PD need of some the teachers. Further research should be conducted to determine which specific teachers need this training.

Knowledge & skills and attitudes & beliefs have been identified as barriers for teachers with regard to the use of new technologies (Hew & Brush, 2007). Findings of this study reveal that both the administrators and teachers consistently rated their competency lower than their responses to corresponding importance on all of the NETS-A standards, which reveals a need for PD. Administrators and teachers rated themselves most competent on Digital Citizenship and Digital Age Learning Culture. Responses from the semi-structured interview revealed that the school system annually provides

district wide training in these two areas for all faculty; which supports the importance of providing ongoing PD for staff.

Future research addressing the preparation of students for a future in a continually changing digital, global society should use the TSEL and TIEL instruments as tools to guide in the determination of plausible PD for the staff to best address the needs of our changing students. Although there are limitations, these instruments can serve as foundational pieces to assist District Level leaders in obtaining the necessary data to make informed decisions to identify plausible PD training needs of administrators and teachers. District Level needs assessments for professional development planning, whether at the state or local school district level, must request permission to use the TSEL and TIEL instruments from the researcher prior to distribution.

Results of this study may be used to guide decision makers in understanding how utilizing NETS to collect and analyze competencies and perceived level of importance may determine probable technology PD needs. Additionally, this study provides insight of how perceived level of importance may affect administrators and teachers in the selection of professional development. Administrators and teachers competencies were directly aligned to their perceptions of importance; therefore it is imperative that state and school district office professional development leaders, administrators, and teachers realize that perceptions of importance affect choices for PD.

This study is intended to guide school districts with determining probable PD for administrators and teachers to provide leaders and educators the tools needs to positively impact student learning. Many school systems rely solely on Likert score item surveys to determine PD needs. Results of this study reveal that using surveys alone may misguide

decision makers. While results of the TSEL survey reveal that both groups rated engaging in Professional Growth (NETS-T, Standard 5) and Visionary Leadership (NETS-A, Standard 1) low, the semi-structure interview data depict the contrary. All administrators ($n = 2$, 100%) and teachers ($n = 6$, 100%) interviewed shared concerns about the need for professional development. Additionally, the majority of participants ($n = 7$, 88%) expressed an importance for the need of leadership. Therefore if school systems are interested in gathering PD needs from employees, the opportunity for participants to express concerns via open-ended item on a confidential survey is essential. While time consuming, interviewing employees may yield additional valuable information that will help guide more informed decisions regarding PD needs of employees. Data obtained from open-ended items and interviews are essential in distinguishing suitable PD needs of administrators and teachers.

REFERENCES

- 21st Century Skills, Education & Competitiveness*. Report. Tuscon: Partnership for 21st Century Skills, 2008.
- Afshari, M., Bakar, K., Luan, W., Afshari, M., Fooi, F., & Samah, B. (2010). Computer Use by Secondary School Principals. *Turkish Online Journal Of Educational Technology - TOJET*, 9(3), 8-25
- Alessi, S. M., & Trollip, S. R. (2000). *Multimedia for learning: Methods and development* (3rd ed.) Boston, MA: Allyn & Bacon
- Allen, J. G. (2003). *A study of the professional development needs of ohio principals in the area of educational technology* (Doctoral dissertation). Retrieved from ProQuest. (3093352)
- Association of College and Research Libraries. (2000). *Information literacy competency standards for higher education*. Chicago, IL: American Library Association. Retrieved March 7, 2013, from <http://www.ala.org/acrl/standards/informationliteracycompetency>
- Bass, B. M. & Riggio, R. E. (2006). *Transformational leadership*. Mahwah, NJ: Erlbaum.
- Baylor, A. L., & Ritchie, D. (2002). What Factors Facilitate Teacher Skill, Teacher Morale, and Perceived Student Learning in Technology-Using Classrooms?. *Computers & Education*, 39(4), 395-414.
- Bell, F. (2011). Connectivism: Its Place in Theory-Informed Research and Innovation in Technology-Enabled Learning. *International Review Of Research In Open And Distance Learning*, 12(3), 98-118.
- Center for Applied Research in Educational Technology. (2000). *Technology support: Its depth, breadth, and impact in America's schools*. Retrieved from <http://www.crito.uci.edu/tlc/html/findings.html>
- Clausen, J. M., Britten, J., & Ring, G. (2008, September/October). Envisioning effective laptop initiatives, *Learning & Leading with Technology*, 36(2), 18-22.
- Cornelius-White, J. D. (2007). Learner-centered teacher-student relationships are effective: A meta-analysis. *Review of Educational Research*, 77, 113–143.
- Corporation for Public Broadcasting. (2003). *Connected to the future*. Washington, DC. Retrieved from <http://www.cpb.org/pressroom/release.php?prn=314>

- Council of Chief State School Officers (CCSSO), (2008, June 3). *Education Leadership Review*, 10 (1), 1 – 12.
- Cradler, J., & Bridgforth, E. (1996). *Recent research on the effects of technology on teaching and learning*. Policy Brief. San Francisco, CA: WestEd Regional Educational Laboratory.
- Creswell, J.W. (2005). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Columbus, OH: Pearson Education, Inc.
- Creswell, J. W., Clark, V. L., Gutman, M.L., & Hanson, W. E. (2003). Advanced mixed method research designs. In A. Tashakkori & C. Teddlie. (Ed.), *Handbook of mixed methods in social & behavioral research*. Thousand Oaks, CA: Sage Publications.
- DVaus, D. (2001). Research design in social research [Electronic version]. *High School Magazine*, 7(1), 30-32.
- Dewey, J. (1916). *Democracy and education*. New York: McMillan.
- Drew, S. (2013). Open up the Ceiling on the Common Core State Standards: Preparing Students for 21st-Century Literacy--Now. *Journal Of Adolescent & Adult Literacy*, 56(4), 321-330.
- Driscoll, M. P. (2005). *Psychology of learning for instruction (3rd ed.)*. Boston: Alyn & Bacon.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 42, 255-284.
- Flowers, C.P. & Algozzine, R.F. (2000). *Development and Validation of Scores on the Basic Technology Competencies for Educators Inventory*, *Educational and Psychological Measurement*, 60(3), 411-418.
- Fox, R., & Henri, J. (2005). Understanding teacher mindsets: IT and change in Hong Kong schools. *Educational Technology & Society*, 8(2), 161–169.
- Freidus, H., Baker, C., Feldman, S., Hirsch, J., Stern, L., Sayres, B., & ... Wiles-Kettenmann, M. (2009). Insights into Self-guided Professional Development: Teachers and teacher educators working together. *Studying Teacher Education: Journal Of Self-Study Of Teacher Education Practices*, 5(2), 183-194.
doi:10.1080/17425960903306948
- Fullen, M. G. (2001). *The new meaning of educational change (3rd ed)*. New York: Teachers College Press.

- Gray, L., Thomas, N., & Lewis, L. (2010). *Teachers' use of educational technology in US public schools: 2009 (NCES 2010-040)*. Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.
- Grey-Bowen, J. E. (2010, January 1). *A Study of Technology Leadership among Elementary Public School Principals in Miami-Dade County*. ProQuest LLC.
- Hargreaves, A., & Goodson, I. (2006). Educational change over time? The sustainability and nonsustainability of three decades of secondary school change and continuity. *Educational Administration Quarterly*, 42(1), 3.
- Hennessy, S., Ruthven, K., & Brindley, S. (2005). Teacher perspectives on integrating ICT into subject teaching: Commitment, constraints, caution, and change. *Journal of Curriculum Studies*, 35(2), 155–192.
- Hermans, R. R., Tondeur, J. J., van Braak, J. J., & Valcke, M. M. (2008). The Impact of Primary School Teachers' Educational Beliefs on the Classroom Use of Computers. *Computers & Education*, 51(4), 1499-1509.
- Hew, K., & Brush, T. (2007). Integrating Technology into K-12 Teaching and Learning: Current Knowledge Gaps and Recommendations for Future Research. *Educational Technology Research And Development*, 55(3), 223-252.
- Hightower, A.E. (2009, March). Tracking U.S. trends: States earn B average for policies supporting educational technology use. *Education Week: Technology Counts*, 28.
- IBM. (2012). IBM® SPSS® Statistics [computer software]. Somers, NY: IBM Corporation
- International Society for Technology in Education (ISTE). (2011). *National educational technology standards for administrators*. Washington, DC: Author. Retrieved February 23, 2013 from <http://www.iste.org/standards/nets-for-administrators.aspx>
- International Society for Technology in Education (ISTE), (2013). *National educational technology standards for administrators*. Washington, DC: Author Retrieved February 15, 2013, from <http://www.iste.org/standards/nets-for-administrators>
- International Society for Technology in Education (ISTE), (2012). *National educational technology standards for students*. Washington, DC: Author Retrieved March 7, 2013, from <http://www.iste.org/standards/nets-for-students>
- International Society for Technology in Education (ISTE), (2012). *National educational technology standards for teachers*. Washington, DC: Author Retrieved March 7, 2013, from <http://www.iste.org/standards/nets-for-teachers>

- Karagiorgi, Y. (2005). Throwing light into the black box of implementation: ICT in Cyprus elementary schools. *Educational Media International*, 42(1), 19–32.
- Lim, C. P., & Chai, C. S. (2008). Teachers' pedagogical beliefs and their planning and conduct of computer-mediated classroom lesson. *British Journal of Educational Technology*, 39(5), 807–828.
- Lowther, D. L., Inan, F. A., Strahl, J. D., & Ross, S. M. (2008). Does technology integration “work” when key barriers are removed? *Educational Media International*, 45(3), 189–206.
- Marshall, C., & Rossman, G.B. (1999). *Designing qualitative research*. Thousand Oaks, CA: Sage Publications.
- McLoughlin, C., & Lee, M. W. (2010). Personalised and Self Regulated Learning in the Web 2.0 Era: International Exemplars of Innovative Pedagogy Using Social Software. *Australasian Journal Of Educational Technology*, 26(1), 28-43.
- Means, B., Blando, J., Olson, K., Middletons, T., Morocco, C., Remz, A., & Zorfass, J. (1993). *Using technology to support education reform*. Washington D.C.: U.S. Department of Education National Commission on Excellence in Education, Office of Educational Research and Improvement.
- Mishra, P. & Koehler, M.J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054.
- National Center for Education Statistics. (2008). *Digest of Education Statistics 2007* (No. NCES 2008–022). Washington, DC: U.S. Government Printing Office .
- Northouse, P. G. (2010). *Leadership: Theory and practice* (5th ed.). Thousand Oaks, CA: Sage.
- Papa, R. (2011). Program evaluation and technology integration strategies. In R. Papa (Ed.), *Technology leadership for school improvement* (pp. 253-276). Thousand Oaks, CA US: Sage Publications, Inc.
- Partnership for 21st Century Skills. (200). P12 *Framework Definitions*. Retrieved March 7, 2013, from www.p21.org/documents/Pd1_Framework_Definitions.pdf
- Pinsonneault, A., & Kraemer, K. L. (1993). Survey research methodology in management information systems: An assessment. *Journal of Management Information Systems*, 10, 75-105.
- Polly, D. (2008). Modeling the influence of calculator use and teacher effects on first grade students' mathematics achievement. *Journal of Technology in Mathematics and Science Teaching*, 27(3), 245-263.

- Prensky, M. (2008). Turning on the lights. *Educational Leadership*, 65(6), 40-45.
- Rossmann, G., & Wilson, B. (1985). Numbers and words: Combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation Review*, 9, 627-643.
- Sawtelle, S.M. (2008). Does this really work? *Learning & Leading with Technology*, 33(8), 12-15.
- Siemens, G. (2004). Connectivism: A learning theory for the digital age. Retrieved from <http://www.elearnspace.org/Articles/connectivism.htm>.
- Smaldino, S., Lowther, D., & James, R. (2012). *Instructional technology and media for learning*. (10th ed.). Boston, MA: Pearson.
- Sparks, D. (2007). Changing organizations begins with changing ourselves. *Edge*, 3(1).
- U.S. Department of Education (2000). Preparing tomorrow's teachers to use technology. Washington, DC: President's Committee of Advisors on Science and Technology, Panel on Educational Technology.
- U.S. Department of Education (2004). *National education technology plan*. Retrieved from <http://www.NationalEdTechPlan.org>
- U. S. Department of Education. (2010). *Transforming American education: Learning powered by technology*. Washington, DC: Office of Educational Technology.
- U. S. Department of Education. (2012). Race to the top fund. Retrieved March 7, 2013. <http://www2.ed.gov/programs/racetothetop/index.html>
- Wang, C., & Bird, J. J. (in press). Multi-level modeling of principal authenticity and teachers' trust and engagement. *Academy of Educational Leadership Journal*.
- Wells, J.G. (2007). Key design factors in durable instructional technology professional development. *Journal of Technology and Teacher Education*, 15(1), 101-122.
- Williams, D., Coles, L., Wilson, K., Richardson, A., & Tuson, J. (2000). Teachers and ICT: Current use and future needs. *British Journal of Educational Technology*, 31(4), 307-320.
- Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement*. Issues & Answers Report, REL 2007- No. 033. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational

Laboratory South- west. Retrieved Mar 8, 2013, from <http://ies.ed.gov/ncee/edlabs>.

- Zimmerman, B. J. (1989). Models of self-regulated learning and academic achievement. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement*. Theory, research and practice (pp. 1-25). New York: Springer.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: an overview. *Theory into Practice*, 41(2), 64-70
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: historical background, methodological developments, and future prospects. *American Educational Research Journal*, 45(1), 166-183.

APPENDIX A: NATIONAL EDUCATION TECHNOLOGY STANDARDS FOR ADMINISTRATORS (NETS-A)

1. Visionary Leadership

Educational administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization. Educational administrators:

- a. inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders.
- b. engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision.
- c. advocate on local, state, and national levels for policies, programs, and funding to support implementation of a technology-infused vision and strategic plan.

2. Digital Age Learning Culture

Educational administrators create, promote, and sustain a dynamic, digital age learning culture that provides a rigorous, relevant, and engaging education for all students.

Educational administrators:

- a. ensure instructional innovation focused on continuous improvement of digital age learning.
- b. model and promote the frequent and effective use of technology for learning.
- c. provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners.
- d. ensure effective practice in the study of technology and its infusion across the curriculum.
- e. promote and participate in local, national, and global learning communities that stimulate innovation, creativity, and digital age collaboration.

3. Excellence in Professional Practice

Educational administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources. Educational administrators:

- a. allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration.
- b. facilitate and participate in learning communities that stimulate, nurture, and support administrators, faculty, and staff in the study and use of technology.
- c. promote and model effective communication and collaboration among stakeholders using digital age tools.
- d. stay abreast of educational research and emerging trends regarding effective use of technology and encourage evaluation of new technologies for their potential to improve student learning.

APPENDIX A: (Continued)

4. Systemic Improvement

Educational administrators provide digital age leadership and management to continuously improve the organization through the effective use of information and technology resources. Educational administrators:

- a. lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources.
- b. collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning.
- c. recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals.
- d. establish and leverage strategic partnerships to support systemic improvement.
- e. establish and maintain a robust infrastructure for technology, including integrated, interoperable technology systems to support management, operations, teaching, and learning.

5. Digital Citizenship

Educational administrators model and facilitate understanding of social, ethical, and legal issues and responsibilities related to an evolving digital culture. Educational administrators:

- a. ensure equitable access to appropriate digital tools and resources to meet the needs of all learners.
- b. promote, model, and establish policies for safe, legal, and ethical use of digital information and technology.
- c. promote and model responsible social interactions related to the use of technology and information.
- d. model and facilitate the development of a shared cultural understanding and involvement in global issues through the use of contemporary communication and collaboration tools.

APPENDIX B: NATIONAL EDUCATION TECHNOLOGY STANDARDS FOR TEACHERS (NETS-T)

1. Facilitate and Inspire Student Learning and Creativity

Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments. Teachers:

- a. promote, support, and model creative and innovative thinking and inventiveness.
- b. engage students in exploring real-world issues and solving authentic problems using digital tools and resources.
- c. promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.
- d. model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.

2. Design and Develop Digital-Age Learning Experiences and Assessments

Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S. Teachers:

- a. design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.
- b. develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.
- c. customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.
- d. provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching.

3. Model Digital-Age Work and Learning

Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society. Teachers:

- a. demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.
- b. collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.
- c. communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital age media and formats.
- d. model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.

APPENDIX B: (Continued)

4. Promote and Model Digital Citizenship and Responsibility

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices.

Teachers:

- a. advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.
- b. address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources.
- c. promote and model digital etiquette and responsible social interactions related to the use of technology and information.
- d. develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital-age communication and collaboration tools.

5. Engage in Professional Growth and Leadership

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources. Teachers:

- a. participate in local and global learning communities to explore creative applications of technology to improve student learning.
- b. exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.
- c. evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.
- d. contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community.

APPENDIX C: EMAIL REQUEST TO ADMINISTRATORS AND TEACHERS

Initial Email:

Dear Administrators and Teachers,

My name is Patricia Wilkins and I am a doctoral candidate at the University of North Carolina at Charlotte. It is with the permission from your school system's superintendent that I contact you. I would like to invite you to participate in my study of technology competencies and perceptions via an online anonymous survey.

About the Survey/Study:

The *anonymous survey* will take between 10 – 15 minutes to complete. Participation in the online 50-item survey requires you to share basic demographic information, report on your level of proficiency on standards, and rank the level of importance of standards.

The last item in the online survey will ask if you would be willing to participate in a follow-up interview. Email addresses of participants that agree to be interviewed will be entered in random drawing for selection for interviews. The interviews will be conducted in a private location and will consist of the researcher and interviewee only. The interviews will not exceed 30 minutes.

Risks and Benefits of Participating in the Study:

There are no known risks to participants. You will not directly benefit from participating in this study; *however the information you provide may assist your school district leaders with identifying plausible Professional Development needs* to support appropriate and effective use of current technologies in schools.

Completion of the online survey will enter you into a drawing for a \$10 Starbucks gift card. *Five winners will be selected and will be notified by email.* Participants that agree, and are selected to participate in an interview will be entered in to a drawing for a \$50 MasterCard® gift card. *Two winners will be selected and the researcher will personally deliver the gift card.*

Thank you for your time and consideration in participating in this study.

Sincerely,
Patricia Wilkins

If you agree, please click the link below to begin the survey:
(Note: The link to the survey will be active for 2 weeks.)

[Link to survey](#)

APPENDIX D: IRB APPROVAL



UNC CHARLOTTE

Research and Economic Development
Office of Research Compliance

9201 University City Blvd, Charlotte, NC 28223-0001
t/ 704.687.1876 f/ 704.687.0980 <http://research.uncc.edu/compliance-ethics>

Institutional Review Board (IRB) for Research with Human Subjects
Approval of Exemption

Protocol #	13-04-39		
Title:	Comparing Competencies and Importance Perceptions of National Technology Standards for Administrators and Teachers		
Date:	6/5/2013		
Responsible Faculty	Dr. Robert	Algozzine	Educational Leadership
Investigator	Ms. Patricia	Wilkins	Educational Leadership

The Institutional Review Board (IRB) certifies that the protocol listed above is exempt under category 2 (45 CFR 46.101).

Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:

- a) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
- b) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

This approval will expire one year from the date of this letter. In order to continue conducting research under this protocol after one year, the "Annual Protocol Renewal Form" must be submitted to the IRB. Please note that it is the investigator's responsibility to promptly inform the committee of any changes in the proposed research, as well as any unanticipated problems that may arise involving risks to subjects. Amendment and Event Reporting forms are available on our web site: <http://research.uncc.edu/compliance-ethics/human-subjects/amending-your-protocol> or <http://research.uncc.edu/compliance-ethics/human-subjects/reporting-adverse-events>


Dr. McLyn Exum, IRB Chair


Date



APPENDIX E: LETTER TO ASSISTANT SUPERINTENDENT

Dear Superintendent:

My name is Patricia Wilkins and I am a doctoral candidate at the University of North Carolina at Charlotte. Please allow me to share some information with you about my study and the potential impact your school district's participation may contribute in the field of educational technology.

I am currently researching competencies and perceptions of importance of the National Education Technology Standards for administrators (NETS-A) and teachers (NETS-T) in elementary and middle school settings. Findings from the study will assist educational technology professionals in identifying plausible Professional Development (PD) needs of school administrators and teachers to support appropriate and effective use of current technologies in schools. Findings will additionally support building an awareness of technology standards for district level personal, school administrators, and teachers; and provide decision makers with a basis for making informed decisions to improve (PD) training.

I would like to invite your school district to participate in this study. It would involve teachers and administrators completing a 50-item validated online anonymous survey in which staff members will self-report their current competency and perceived level of importance on the current national technology standards. A survey will be distributed to potential participants via your school district's secure email server. The survey will take between 10 – 15 minutes to complete. The data collected during the survey will be kept private; schools and participants will remain anonymous. The last item in the survey will ask if participants would be willing to participate in a follow-up interview. Email addresses of participants that agree to be interviewed will be collected and a random selection process will be used to determine interviewees. The researcher will contact participants' that are selected for interviews individually. The interviews will be conducted in a private location (selected by the school principal) within the participant's school and will consist of the researcher and interviewee only. The interviews will not exceed 30 minutes. The interviews are important to assist the researcher in confirming evidences and findings from the anonymous surveys.

If you decide to allow your school district to participate in the study, participants may choose to complete the online survey only or they may choose to complete the online survey and agree to be chosen to participate in a follow-up interview. Results of the study will be shared with the superintendent. [Survey Link](#)

If you have any questions, please contact me at the University of North Carolina at Charlotte (704) 687-8734 or email me at pcwilkin@uncc.edu. You may also contact Dr. Bob Algozzine, UNC-Charlotte College of Education at (704) 687-8859. Dr. Algozzine is the faculty member working with me in this research endeavor. You may also contact the Office of Research Compliance at UNC-Charlotte at (704) 687-1871 if you have questions concerning your participant rights in research of this type.

Thank you in advance for your time and support of this opportunity.

Sincerely,
Patricia C. Wilkins

APPENDIX F: LETTER TO PARTICIPANTS

Dear Teachers/Administrators:

My name is Patricia Wilkins and I am a doctoral candidate at the University of North Carolina at Charlotte. Please allow me to share some information with you about my study and the potential impact your participation may contribute in the field of educational technology.

I am currently researching competencies and perceptions of importance of the National Education Technology Standards for administrators (NETS-A) and teachers (NETS-T) in elementary and middle school settings. Findings from the study will assist educational technology professionals in identifying plausible Professional Development (PD) needs of school administrators and teachers to support appropriate and effective use of current technologies in schools. Findings will additionally support building an awareness of technology standards for district level personal, school administrators, and teachers; and provide decision makers with a basis for making informed decisions to improve (PD) training.

I would like to invite you to participate in this study. It would involve you completing a 50-item validated online anonymous survey in which you self-report your current competency and perceived level of importance on the current national technology standards. The survey will be distributed to potential participants via your school district's secure email server. The survey will take between 10 – 15 minutes to complete. The data collected during the survey will be kept private; schools and participants will remain anonymous. The last item in the survey will ask if you would be willing to participate in a follow-up interview. Email addresses of participants that agree to be interviewed will be collected and a random selection process will be used to determine interviewees. The researcher will contact participants' that are selected for interviews individually. The interviews will be conducted in a private location within the participant's school and will consist of the researcher and interviewee only. The interviews will not exceed 30 minutes. The interviews are important to assist the researcher in confirming evidences and findings from the anonymous surveys.

If you decide to participate in the study, you may choose to complete the online survey only or you may choose to complete the online survey and agree to be chosen to participate in a follow-up interview. [Link to Survey](#)

If you have any questions, please contact me at the University of North Carolina at Charlotte (704) 687-8734 or email me at pcwilkin@uncc.edu. You may also contact Dr. Bob Algozzine, UNC-Charlotte College of Education at (704) 687-8859. Dr. Algozzine is the faculty member working with me in this research endeavor. You may also contact the Office of Research Services at UNC-Charlotte at (704) 687-3311 if you have questions concerning your participant rights in research of this type.

Thank you in advance for your time and support of this opportunity.

Sincerely,
Patricia C. Wilkins

APPENDIX G: FOLLOW-UP EMAIL FOR SURVEY

Reminder Email:

Dear Administrators and Teachers,

As you may recall from my invitation to participate in my study of technology competencies and perceptions, I am conducting an *online anonymous survey* that should take between 10 - 15 minutes to complete. Your participation may benefit your school district with determining appropriate Professional Development needs for administrators and teachers!

Gentle reminders:

1. Completion of the online survey will enter you in to a drawing for a \$10 Starbucks gift card (*5 winners will be selected*). Participants that agree, and are selected to participate in an interview will be entered in to a drawing for a \$50 MasterCard ® gift card (*2 winners will be selected*).

2. The link to the survey will expire in one week.

Your participation in this study would be greatly appreciated!

Thank you,
Patricia Wilkins

If you would be willing to assist, please click the link below to begin the survey:

[Link to Survey](#)

APPENDIX H: TECHNOLOGY SURVEY FOR EDUCATIONAL LEADERS (TSEL)

Survey Instructions: You have been asked to complete this *50 item anonymous survey* as part of a research study. Pilot testing indicates that it should take approximately 10 – 15 minutes to complete. Survey items are based on the International Society for Technology in Education (ISTE) National Education Technology Standards for Administrators and Teacher (NETS-A; NETS-T). Results of the survey will help to guide leadership training and professional development programming; therefore it is important to answer honestly.

Section 1(10 items) contains demographic items

Section 2(40 items) contains perception and competency items.

SECTION 1: Demographics

Instructions: Before you begin the actual survey, please take a moment to tell me about yourself.

1. Gender:
Male or Female
2. Race:
White, Black/African American, Hispanic, American Indian, Asian, Native Hawaiian or Pacific Islander, Multi-Race, Other
3. School Level
Elementary or Middle School
4. School Code
Obtain codes from School District
5. Highest degree earned
Undergraduate, Masters, Doctorate
6. Years teaching experience
0-4, 5-9, 10-14, 15-19, More than 19
7. Years of administrative experience
0-4, 5-9, 10-14, 15-19, More than 19
8. Current District Role
Teacher, Technology Facilitator, Lead Teacher, Special Area, Assistant Principal, Principal, Other
9. How many in-service *technology training* workshops did you participate in last *school year (2012-2013)*?
None, One, Two, Three, Four or more

APPENDIX H: (Continued)

10. Do you have access to a computer at home?

Yes, No

SECTION 2: Perceptions and Competencies of Administrators and Teachers

Instructions: This section of the survey contains items relevant to administrators and teachers that will reflect your perceptions importance and competency of National Education Technology Standards for administrators and teachers.

Statement	Importance				Competence			
Please read each statement below and select the rating that best reflect your perception of importance for implementation and your competence .	Please select a rating for each item below based on your perception of the importance for implementation of technology in your school/classroom				Please select a rating for each item below based on your perception of your competence for the technology standard in your school/classroom.			
	NVI =Not Very Important SI =Somewhat Important I =Important VI =Very Important				NVC =Not Very Competent SC =Somewhat Competent C =Competent VC = Very Competent			
1. Facilitate shared development by all stakeholders of a vision for technology use and widely communicate that vision to faculty members.	NVI	SI	I	VI	NVC	SC	C	VC
2. Promote, support, and model creative and innovative thinking and inventiveness.	NVI	SI	I	VI	NVC	SC	C	VC
3. Maintain inclusive and cohesive process to develop implement, monitor, and communicate a dynamic long-range, and systemic technology plan to achieve the vision.	NVI	SI	I	VI	NVC	SC	C	VC
4. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources.	NVI	SI	I	VI	NVC	SC	C	VC

Statement	Importance				Competence			
Please read each statement below and select the rating that best reflect your perception of importance for implementation and your competence .	Please select a rating for each item below based on your perception of the importance for implementation of technology in your school/classroom				Please select a rating for each item below based on your perception of your competence for the technology standard in your school/classroom.			
	NVI =Not Very Important SI =Somewhat Important I =Important VI =Very Important				NVC =Not Very Competent SC =Somewhat Competent C =Competent VC = Very Competent			
5. Advocate on the state and national levels, for policies, programs, and funding opportunities that support implementation of the district technology plan.	NVI	SI	I	VI	NVC	SC	C	VC
6. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.	NVI	SI	I	VI	NVC	SC	C	VC
7. Use data in making leadership decisions.	NVI	SI	I	VI	NVC	SC	C	VC
8. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.	NVI	SI	I	VI	NVC	SC	C	VC
9. Foster and nurture a culture of responsible, risk-taking faculty and advocate policies promoting continuous innovation with technology use in school.	NVI	SI	I	VI	NVC	SC	C	VC
10. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.	NVI	SI	I	VI	NVC	SC	C	VC
11. Provide for learner-centered environments that use technology to meet the individual and diverse needs of learners.	NVI	SI	I	VI	NVC	SC	C	VC

Statement	Importance				Competence			
Please read each statement below and select the rating that best reflect your perception of importance for implementation and your competence .	Please select a rating for each item below based on your perception of the importance for implementation of technology in your school/classroom				Please select a rating for each item below based on your perception of your competence for the technology standard in your school/classroom.			
	NVI =Not Very Important SI =Somewhat Important I =Important VI =Very Important				NVC =Not Very Competent SC =Somewhat Competent C =Competent VC = Very Competent			
12. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.	NVI	SI	I	VI	NVC	SC	C	VC
13. Model the routine, intentional, and effective use of technology.	NVI	SI	I	VI	NVC	SC	C	VC
14. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.	NVI	SI	I	VI	NVC	SC	C	VC
15. Employ Technology for communication and collaboration among colleagues, staff, parents, students, the community, and global outreach.	NVI	SI	I	VI	NVC	SC	C	VC
16. Provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching.	NVI	SI	I	VI	NVC	SC	C	VC
17. Provide for and ensure that faculty and staff take advantage of quality professional learning opportunities for improved learning and teaching with technology.	NVI	SI	I	VI	NVC	SC	C	VC

Statement	Importance				Competence			
Please read each statement below and select the rating that best reflect your perception of importance for implementation and your competence .	Please select a rating for each item below based on your perception of the importance for implementation of technology in your school/classroom				Please select a rating for each item below based on your perception of your competence for the technology standard in your school/classroom.			
	NVI =Not Very Important SI =Somewhat Important I =Important VI =Very Important				NVC =Not Very Competent SC =Somewhat Competent C =Competent VC = Very Competent			
18. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.	NVI	SI	I	VI	NVC	SC	C	VC
19. Create and participate in learning communities that stimulate, nurture, and support faculty and staff in using technology for improved productivity.	NVI	SI	I	VI	NVC	SC	C	VC
20. Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.	NVI	SI	I	VI	NVC	SC	C	VC
21. Engage in sustained, job-related professional learning using technology resources.	NVI	SI	I	VI	NVC	SC	C	VC
22. Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital-age media and formats.	NVI	SI	I	VI	NVC	SC	C	VC
23. Maintain awareness of emerging technologies and their potential uses in education.	NVI	SI	I	VI	NVC	SC	C	VC
24. Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.	NVI	SI	I	VI	NVC	SC	C	VC

Statement	Importance				Competence			
Please read each statement below and select the rating that best reflect your perception of importance for implementation and your competence .	Please select a rating for each item below based on your perception of the importance for implementation of technology in your school/classroom				Please select a rating for each item below based on your perception of your competence for the technology standard in your school/classroom.			
	NVI =Not Very Important SI =Somewhat Important I =Important VI =Very Important				NVC =Not Very Competent SC =Somewhat Competent C =Competent VC = Very Competent			
25. Use multiple methods to assess and evaluate appropriate uses of technology resources for learning, communication, and productivity.	NVI	SI	I	VI	NVC	SC	C	VC
25. Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.	NVI	SI	I	VI	NVC	SC	C	VC
27. Use technology to collect and analyze data, interpret results, and communicate findings to improve instructional practice and student learning.	NVI	SI	I	VI	NVC	SC	C	VC
28. Address the diverse needs of all learners by using learner-centered strategies and providing equitable access to appropriate digital tools and resources.	NVI	SI	I	VI	NVC	SC	C	VC
29. Use technology to assess, evaluate, and manage administrative and operational systems.	NVI	SI	I	VI	NVC	SC	C	VC
30. Promote and model digital etiquette and responsible social interactions related to the use of technology and information.	NVI	SI	I	VI	NVC	SC	C	VC

Statement	Importance				Competence			
Please read each statement below and select the rating that best reflect your perception of importance for implementation and your competence .	Please select a rating for each item below based on your perception of the importance for implementation of technology in your school/classroom				Please select a rating for each item below based on your perception of your competence for the technology standard in your school/classroom.			
	NVI =Not Very Important SI =Somewhat Important I =Important VI =Very Important				NVC =Not Very Competent SC =Somewhat Competent C =Competent VC = Very Competent			
31. Assess staff knowledge, skills, and performance in using technology and use results to facilitate quality professional development and to inform personnel decisions.	NVI	SI	I	VI	NVC	SC	C	VC
32. Develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital-age communication and collaboration tools.	NVI	SI	I	VI	NVC	SC	C	VC
33. Ensure equity of access to technology resources that enable and empower all learners and educators.	NVI	SI	I	VI	NVC	SC	C	VC
34. Participate in local and global learning communities to explore creative applications of technology to improve student learning.	NVI	SI	I	VI	NVC	SC	C	VC
35. Identify, communicate, model, and enforce social, legal, and ethical practices to promote responsible use of technology.	NVI	SI	I	VI	NVC	SC	C	VC
36. Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.	NVI	SI	I	VI	NVC	SC	C	VC
37. Promote and enforce privacy, security, and online safety related to use of technology.	NVI	SI	I	VI	NVC	SC	C	VC

Statement	Importance				Competence			
Please read each statement below and select the rating that best reflect your perception of importance for implementation and your competence .	Please select a rating for each item below based on your perception of the importance for implementation of technology in your school/classroom				Please select a rating for each item below based on your perception of your competence for the technology standard in your school/classroom.			
	NVI =Not Very Important SI =Somewhat Important I =Important VI =Very Important				NVC =Not Very Competent SC =Somewhat Competent C =Competent VC = Very Competent			
38. Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.	NVI	SI	I	VI	NVC	SC	C	VC
39. Promote and enforce environmentally safe and healthy practices in the use of technology.	NVI	SI	I	VI	NVC	SC	C	VC
40. Contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community.	NVI	SI	I	VI	NVC	SC	C	VC

Open-Ended Item (Optional)

Please use the space below to share any additional information or address any questions or concerns you may have at this time.

APPENDIX H: (Continued)

Open-Ended Item (Required)

Will you be willing to participate in a 5 item interview to provide the researcher with additional information about technology?

If YES, please provide your email address in the 'Comment' box below.

Yes

No

APPENDIX I: PERMISSION TO USE SURVEY FORM DR. JAMES G. ALLEN

Tuesday, January 29, 2013 2:43 PM

Dr. Allen,

Good Afternoon! My name is Patti Wilkins and I am a lecturer at UNC-Charlotte in the Educational Leadership Department and also a doctoral candidate in the Community Track of the Ed. Leadership Department. Currently, I am in the Dissertation Proposal Seminar class in which we work on the first 3 chapters of our dissertation.

I have reviewed a study completed by Cynthia Cummings in which she utilized a survey you created. I am writing to request permission to use your Principals' Technology Survey (entitled "Educational Technology for Principals Survey) based on the NETS-A standards. May I have permission to use that survey?

Sincerely,
Patti

Patti Wilkins

Patricia Wilkins, M.Ed. | Professor of Instructional Systems Technology UNC Charlotte |
Dept. of Educational Leadership | COED 263
9201 University City Blvd. | Charlotte, NC 28223
Phone: 704-687-8734 | Fax: 704-687-3493 pcwilkin@uncc.edu |

APPENDIX J: PERMISSION TO USE SURVEY FROM DR. ALGOZZINE AND DR.
FLOWERS

Saturday, June 8, 2013 4:39 PM

Drs. Algozzine and Flowers,
Good Afternoon! My name is Patti Wilkins and I am a lecturer at UNC-Charlotte in the Educational Leadership Department and also a doctoral candidate in the Community Track of the Ed. Leadership Department.

Currently I am in an Independent Study, which is the final course in my program. At this time, I am reviewing surveys for potential use to assist me with my comparative study of competencies and perceptions of National Technology Standards for Administrators and Teachers.

I am writing to request permission to use your “Basic Technology Competencies for Educators Inventory” (BTCEI) which was developed to evaluate critical areas that support and enhance professional productivity and information access needed by educators (Flowers and Algozzine, 2000). The BTCEI contains items that I would like to potentially edit so that I may assess the technology competencies of career educators and their professional development needs.

May I have permission to use your survey?

Sincerely,
Patti

Patti Wilkins

Patricia Wilkins, M.Ed. | Professor of Instructional Systems Technology UNC Charlotte |
Dept. of Educational Leadership |COED 263
9201 University City Blvd. | Charlotte, NC 28223
Phone: 704-687-8734 | Fax: 704-687-3493 pcwilkin@uncc.edu |

APPENDIX K: APPROVAL FROM DR. JAMES G. ALLEN TO USE ETPS

Thursday, January 31, 2013 6:55 PM

Hi Patti:

Yes, of course – you have my permission to use the survey. Please note that the standards have been updated since I developed the instrument in 2003 so you will need to include the updated language. Good luck with your study! Please send me an abstract or a link when you are finished – I would love to see if your results are similar! One final note - - how were you able to find me? Glad you did - - just curious!

Jim Allen
Associate Professor
Educational Leadership
Northern Kentucky University

APPENDIX L: APPROVAL FROM DR. ALGOZZINE AND DR. FLOWERS TO USE
BTCEI

Saturday, June 8, 2013 9:12 PM

You are free to use our instrument as represented below provided you attribute attention and authorship to the original scale and specifically describe any modifications related to our work in your dissertation and any other publications. Good luck with your research.

Bob Algozzine

APPENDIX M: ITEM STANDARDS MATRIX

Survey Item	NETS-A					NETS-T								
	Administrator Standards					Teacher Standards								
	1	2	3	4	5	1	2	3	4	5				
1. Facilitate shared development by all stakeholders of a vision for technology use and widely communicate that vision to faculty members.	X													
2. Promote, support, and model creative and innovative thinking and inventiveness.						X								
3. Maintain inclusive and cohesive process to develop implement, monitor, and communicate a dynamic long-range, and systemic technology plan to achieve the vision.	X													
4. Engage students in exploring real-world issues and solving authentic problems using digital tools and resources.										X				
5. Advocate on the state and national levels, for policies, programs, and funding opportunities that support implementation of the district technology plan.	X													
6. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.										X				
7. Use data in making leadership decisions.	X													
8. Model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.										X				
9. Foster and nurture a culture of responsible, risk-taking faculty and advocate policies promoting continuous innovation with technology use in school.						X								
10. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.											X			
11. Provide for learner-centered environments that use technology to meet the individual and diverse needs of learners.						X								
12. Develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.											X			
13. Model the routine, intentional, and effective use of technology.						X								
14. Customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.												X		

Survey Item	NETS-A					NETS-T				
	Administrator Standards					Teacher Standards				
	1	2	3	4	5	1	2	3	4	5
15. Employ technology for communication and collaboration among colleagues, staff, parents, students, the community, and global outreach.		X								
16. Provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching.							X			
17. Provide for and ensure that faculty and staff take advantage of quality professional learning opportunities for improved learning and teaching with technology.			X							
18. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.								X		
19. Create and participate in learning communities that stimulate, nurture, and support faculty and staff in using technology for improved productivity.			X							
20. Collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.								X		
21. Engage in sustained, job-related professional learning using technology resources.			X							
22. Communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital-age media and formats.								X		
23. Maintain awareness of emerging technologies and their potential uses in education.			X							
24. Model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.								X		
25. Use multiple methods to assess and evaluate appropriate uses of technology resources for learning, communication, and productivity.					X					
25. Advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.									X	
27. Use technology to collect and analyze data, interpret results, and communicate findings to improve instructional practice and student learning.					X					
28. Address the diverse needs of all learners by using learner-centered strategies and providing equitable access to appropriate digital tools and resources.									X	
29. Use technology to assess, evaluate, and manage administrative and operational systems.					X					

Survey Item	NETS-A					NETS-T				
	Administrator Standards					Teacher Standards				
	1	2	3	4	5	1	2	3	4	5
30. Promote and model digital etiquette and responsible social interactions related to the use of technology and information.									X	
31. Assess staff knowledge, skills, and performance in using technology and use results to facilitate quality professional development and to inform personnel decisions.				X						
32. Develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital-age communication and collaboration tools.									X	
33. Ensure equity of access to technology resources that enable and empower all learners and educators.					X					
34. Participate in local and global learning communities to explore creative applications of technology to improve student learning.										X
35. Identify, communicate, model, and enforce social, legal, and ethical practices to promote responsible use of technology.					X					
36. Exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.										X
37. Promote and enforce privacy, security, and online safety related to use of technology.					X					
38. Evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.										X
39. Promote and enforce environmentally safe and healthy practices in the use of technology.					X					
40. Contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community.										X

APPENDIX N: EMAIL/PHONE SCRIPT FOR INTERVIEW INVITES

Initial Email:

Dear Participant,

Thank you for agreeing to participate in the semi-structured interview process of my study. As you may recall, this interview should not exceed 30 minutes. It may be important to provide a 45-minute time allotment in your schedule to allow for your travel to and from the interview location from your office / classroom to the private location in your school.

Please reply with three potential dates and times that you are available this week for an interview. I will reply with a confirmation day and time.

Thank you in advance for your assistance.

Sincerely,

Patricia Wilkins

Phone reminder:

Researcher: Thank you for agreeing to participate in the semi-structured interview process of my study. Last week, I sent you an email to set up a date and time for the interview. If you prefer, we can set that day and time now.

Researcher: Although the interview will not exceed 30 minutes. It may be important for us to look for a 45-minute block of time in your schedule to allow for your travel to and from the interview location from your office / classroom to the private location in your school.

Researcher: What days and times do you have available this week?

Researcher: Great, I will send you a confirmation email with this date and time. Thank you for your time.

APPENDIX O: TECHNOLOGY INTERVIEW FOR EDUCATIONAL LEADERS
(TIEL)

Thank you for meeting with me, before we begin, I would like to obtain your informed consent. Your responses will be recorded; however after I transcribe the data, the recording will be deleted. By answering yes, you are providing consent. Do you agree to allow me to conduct this interview? Answer: Yes or No

Semi-Structured Interview Items (Administrators)

The technology standards for administrators are sub-divided into 5 categories. I will read each category one at a time. Please reflect on each and share a personal behavior or practice that you currently use in your school that exhibits or models the behavior and would 'fit' the category. Also, please rank [low 1- 4 high] your competence level and perceived importance for each category.

Before I begin reading the category, do you have any questions?

1. Visionary Leadership:

Rank of Visional Leadership:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

2. Digital Age Learning Culture:

Rank of Digital Age Learning Culture:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

3. Excellence in Professional Practice:

Rank of Excellence in Professional Practice:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

4. Systematic Improvement:

Rank of Systematic Improvement:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

5. Digital Citizenship:

Rank of Digital Citizenship:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

Open Ended Item:

Do you have anything else you would like to share with me regarding technology competency and/or perceived importance of technology?

Thank you for meeting with me, before we begin, I would like to obtain your informed consent. Your responses will be recorded; however after I transcribe the data, the recording will be deleted. By answering yes, you are providing consent. Do you agree to allow me to conduct this interview? Answer: Yes or No

Semi-Structured Interview Items (Teachers)

The technology standards for teachers are sub-divided into 5 categories. I will read each category one at a time. Please reflect on each and share a personal behavior or practice that you currently use in your classroom that exhibits or models the behavior and would 'fit' the category. Also, please rank [low 1- 4 high] your competence level and perceived importance for each category. Before I begin reading the category, do you have any questions?

1. Facilitate and Inspire Student Learning:

Rank of Facilitate and Inspire Student Learning:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

2. Design and Develop Digital Age Learning Experiences:

Rank of Design and Develop Digital Age Learning Experiences:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

3. Model Digital-Age Work and Learning:

Rank of Model Digital-Age Work and Learning:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

4. Promote and Model Digital Citizenship and Responsibility:

Rank of Promote and Model Digital Citizenship and Responsibility:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

5. Engage in Professional Growth and Leadership:

Rank of Engage in Professional Growth and Leadership:

Competence [1 2 3 4]

Perceived Importance [1 2 3 4]

Open Ended Item:

Do you have anything else you would like to share with me regarding technology competency and/or perceived importance of technology?

APPENDIX P: COPYRIGHT PERMISSION FROM ISTE TO USE NETS

The Permissions Company, Inc.
47 Seneca Road
P. O. Box 604
Mount Pocono, PA 18344
570.839.7477 (vox) 570.839.7448 (fax)
e-mail: PermDude@eclipse.net

March 3, 2014

Patricia Wilkins, M.Ed.
UNC Charlotte
Dept. of Educational Leadership
COED 263
9201 University City Blvd.
Charlotte, NC 28223

Dear Professor Wilkins:

Thank you for your request, for permission to use the previous National Educational Technology Standards in your doctorate dissertation at UNC-Charlotte.

This letter will grant you permission to use the material as requested in your dissertation and in all copies to meet university requirements, including University Microfilms edition. You must credit your work as the source of the material, and you must re-apply if your dissertation is later published. Please also take care, in the text of your work, to note that the NETS standards being referenced are historical ones and are not current.

In lieu of a fee, please have a copy of your dissertation sent to:

Carolyn Sykora
ISTE®
180 West 8th Ave, Suite 300
Eugene, OR 97401-2916

Many thanks for your interest in ISTE®. Please don't hesitate to contact me if you have any questions.

Sincerely,

Frederick T. Courtright, President
The Permissions Company, Inc.
Rights Agency for the International Society for Technology in Education