

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Educational Administration: Theses,
Dissertations, and Student Research

Educational Administration, Department of

Summer 6-28-2013

Middle School Teachers and Principals Perspectives on Technology

Mark Majeski

University of Nebraska-Lincoln, markmajeski@yahoo.com

Follow this and additional works at: <https://digitalcommons.unl.edu/cehsedaddiss>



Part of the [Elementary and Middle and Secondary Education Administration Commons](#)

Majeski, Mark, "Middle School Teachers and Principals Perspectives on Technology" (2013). *Educational Administration: Theses, Dissertations, and Student Research*. 151.
<https://digitalcommons.unl.edu/cehsedaddiss/151>

This Article is brought to you for free and open access by the Educational Administration, Department of at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Educational Administration: Theses, Dissertations, and Student Research by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Middle School Teachers and Principals Perspectives on Technology

By

Mark Majeski

A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Education

Major: Educational Administration (UNL-UNO)

Under the Supervision of Professor Jody Isernhagen

Lincoln, Nebraska

Middle School Teachers and Principals Perspectives on Technology

Mark Majeski, Ed.D.

University of Nebraska, 2013

Adviser: Jody Isernhagen

In this study, the researcher endeavored to examine Morris County, New Jersey, middle school teacher and principal perspectives on the use of technology in their classrooms and schools. Specifically, this study examined teacher engagement, implementation and limitations related to the use of technology with middle school students.

This study used a mixed method approach to determine educator perspectives on technology use. The questions in the quantitative and qualitative phases of the study were correlated to the research questions as well as to selected national technology standards to substantiate the relationship between the data being collected and the research questions. The research centered on these sub-questions:

1. What is the perspective of middle level classroom teachers when using technology in a classroom setting?
2. What is the perspective of middle level principals when observing technology use in the classroom?
3. What perspectives do middle level teachers have about themselves with regard to the limitations they have concerning true technology integration in the classroom?
4. What perspectives do principals have in regard to the limitations they have concerning true technology integration in the classroom?
5. What are the limitations that middle level teachers and principals perceive that prevent true technology integration in their classrooms?
6. What contributes to middle level teacher engagement in the use of technology to promote academic achievement?

7. What perspectives do principals have that contribute to middle level teacher engagement in the use of technology to promote academic achievement?

Data sources used for collection purposes were an Internet survey, and a semi-structured interview process. Ninety to ninety-two percent of educators either fully or somewhat aligned themselves with the identified National Technology Standards or perceived their ability to meet these standards in their professional responsibilities. Themes emerging from the data indicated that educators are poised to make inroads on the use of technology in middle level classrooms. However, they are stymied by the lack of equipment and continual professional development needed to sustain and engage students in the learning process.

Table of Contents

Chapter One—Introduction and Background.....	1
Problem Statement.....	1
Purpose Statement	3
Setting of the Study	5
Significance of the Study.....	5
Definition of Terms	5
Assumptions	7
Study Limitation and Delimitation	7
Researcher’s Biases	8
Summary and Organization of the Study	8
Chapter Two—Review of Literature.....	10
History of Educational Technology.....	10
Availability of Technology.....	12
Limitations and the Use of Technology	14
The Middle Level School Student.....	19
Technology Standards in Public Education.....	21
Summary.....	25
Chapter Three—Methodology.....	26
Purpose Statement	26
Phase I: Study Population for the Quantitative Survey	27
Description of the Survey	28
Correlation of Survey Questions to Research Questions and Technology Standards	31
Administrative Procedures	31

Reliability and Validity	32
Phase II: Qualitative Research.....	33
Study Population for the Qualitative Study	34
Correlation of Interview Questions to Research Questions and Technology Standards	34
Administrative Procedures	35
Demographic Questions	36
Technology Questions	36
Reliability and Validity	37
Summary	37
Chapter Four—Phase I: Survey Results	39
Introduction	39
Survey Process.....	39
Demographic Survey Responses	40
Survey Technology Questions.....	43
Summary.....	56
Chapter Five—Phase II: Interview Results	57
Introduction	57
Qualitative Design and Methods	57
Interview Themes	57
Teachers’ and Principals’ Interview Process.....	58
Interview Findings.....	58
Teacher Interviews	58
Teacher Interview 1: Ted.....	58
Perspectives	59

Limitations.....	59
Implementation.....	59
Summary.....	60
Teacher Interview 2: Laura	60
Perspectives	61
Limitations.....	61
Implementation.....	61
Summary.....	62
Teacher Interview 3: Brian	63
Perspectives	63
Limitations.....	63
Implementation.....	64
Summary.....	64
Teacher Interview 4: Maria	65
Perspectives	65
Limitations.....	65
Implementation.....	66
Summary.....	66
Teacher Interview 5: Ken	67
Perspectives	67
Limitations.....	67
Implementation.....	68
Summary.....	69
Teacher Interview 6: Ann	69
Perspectives	69

Limitations.....	70
Implementation.....	70
Summary.....	70
Principal Interviews.....	71
Principal Interview 1: Raymond.....	71
Perspectives	71
Limitations.....	72
Implementation.....	72
Summary.....	73
Principal Interview 2: Paul	73
Perspectives	73
Limitations.....	74
Implementation.....	74
Summary.....	74
Principal Interview 3: Nancy.....	75
Perspectives	75
Limitations.....	75
Implementation.....	76
Summary.....	76
Principal Interview 4: Shawn	77
Perspectives	77
Limitations.....	78
Implementation.....	78
Summary.....	79
Summary of Teacher and Principal Interviews	79

Interview Summary	82
Chapter Six—Discussion and Conclusion.....	83
Discussion.....	83
Current Developments in Technology Use in Schools.....	87
Planning for Technology Improvements to Facilitate Teacher and Student Engagement	88
Suggestions for Future research	91
Conclusion.....	92
References	94
Appendices	103

List of Tables

Table 1	Association between the Phase I Research Questions and the Survey Questions.....	32
Table 2	Association between the Phase II Research Questions and the Survey Questions.....	35
Table 3	Middle Level Education Job Position.....	40
Table 4	Respondents' Gender.....	41
Table 5	Respondents' Age Range	41
Table 6	Respondents' Range of Years in Education	42
Table 7	Technology Use in High School, Undergraduate, Graduate Course Work.....	42
Table 8	Highest Academic Degree	43
Table 9	Availability of Classroom Technology Equipment.....	43
Table 10	Access to Technology Equipment.....	44
Table 11	Access to Supportive Devices for Active Boards.....	45
Table 12	Access to Additional Technology Tools	46
Table 13	Professional Development in Technology.....	46
Table 14	Ability to Perceive Limitations of Technology	47
Table 15	Listing of Perceived Limitations	48
Table 16	Perceived Ability for Students Equipped to Handle Technology	49
Table 17	Frequency of Use of Technology	49
Table 18	Perceived Value of Technology	50
Table 19	Willingness to be Interviewed	50
Table 20	Ability to Design Lessons Using Technology.....	52
Table 21	Ability to Exhibit Fluency in Technology.....	52

Table 22	Technology Plans to Promote Achievement	53
Table 23	Environment of Professional Learning for Technology	53

List of Appendices

Appendix A	Internet Survey Instrument	103
Appendix B	Interview Questions	109
Appendix C	Additional Reading	111
Appendix D	IRB Approval	113
Appendix E	Letter to School Superintendents & Sample Permission Letter	116
Appendix F	Survey Consent Form	118
Appendix G	Email to School Principals	120
Appendix H	Email to Teachers & Follow Up Email	123
Appendix I	Phone Script for Selected Teachers and Principals	126
Appendix J	Informed Consent for Teachers and Principals Interviews	128
Appendix K	Project Budget	130
Appendix L	Michael O'Brian's Resume and Letter	132
Appendix M	Areas and Themes	137

Chapter One

Introduction and Background

There are approximately 58 million students educated in the United States annually, and of this population 16.2 million students are identified as being in grades five through eight (US Census Bureau, 2011). In 2009, there were over 3 million teachers employed in our elementary and middle school systems (US Census Bureau, 2011). As national academic standards continue to change, educational systems are forced to place higher demands on achievement for all students (Common Core Standards 2010). Therefore, the way we educate our students across the United States is constantly changing. Yet, to change school practices, technology standards, curriculum goals, and assessments, teacher instructional techniques along with technological skills must mature with the changing educational environment. Without a coordinated development of practices, goals, assessment, and technology, the technology will only reinforce traditional methods (Wiske, 2001). According to the Pew Internet and American Life Project (Lenhart, Madden, & Hitlin, 2005), almost 87% of students in the U. S. between the ages of 12 and 17 years use the Internet and nearly 70% use it as their primary source for information. The use of technology in our schools has become one of the most valuable tools for reaching a large percentage of Net Generation students (McNeeley, 2005).

Problem Statement

Unfortunately, technology methods may not be widely accepted by those individuals educating American students, and there is modest information in the literature

that addresses teacher use and technology methods in the middle school classroom.

(Wang & Reeves, 2003)

Educational standards were designed to advance the academic development and achievement of every student in public schools by outlining the knowledge and skills that students should acquire and be proficient in for each curricular area and each grade level. Additionally, due to the importance of technology and these curricular academic standards, national educational technology standards have been developed. Further detail concerning the National Technology Standards will be explained in the literature review. In 2009, using the National Technology Standards as a springboard the New Jersey Department of Education created and adopted two technology standards that encompass a global perspective on technology, and presume cross content mastery for all students progressively from kindergarten through twelfth grade. Those standards include the following:

- 8.1 Educational Technology. All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.
- 8.2 Technology Education, Engineering, and Design. All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment. (New Jersey Department of Education, 2010b)

With the adoption of the updated technology standards, culled from the national standards, middle level teachers in Morris County, New Jersey were effected by increased accountability for technology across all curricular areas of instruction.

Time has been given by the researcher to find evidence in the literature that supports or disputes why teachers or principals at the middle level, grades five through

nine depending on configuration, perceive the use of technology as a common method of teaching. Although both teachers and students believe that technology has an impact on education and career, a substantial number of teachers lack access to crucial technological resources (Hart, Allensworth, Lauen, & Gladden, 2002).

While school districts have provided professional development opportunities in the use of technology for classroom instruction, there seems to be somewhat of a disconnect between the learned skill and the chosen classroom instructional method (Smith, 2008). Professional development opportunities for educators have been delivered through several modalities. Those modalities include, but are not limited to large, group lecture, small, group hands-on workshops, one-on-one demonstrations, modeling, and online coursework delivery completed by the staff member personally. If in fact these delivery methods continue to be part of the professional development opportunities, why is there a struggle to incorporate technology as a common tool in instruction? It is not the purpose of this study to evaluate the professional development opportunities or the quality of such opportunities, but this research intended to identify the perspectives and beliefs of teachers concerning the incorporation of everyday technological methods in a middle school setting.

Purpose Statement

This study aimed to examine middle school teacher and principal perspectives on the use of technologies in their academic setting. Specifically, the study looked at teacher engagement and implementation limitation related to the use of technology in the educational environment of middle school students. The overarching questions that lead this study were as follows:

1. The Central Question

- A. How do middle level teachers and principals perceive the use of technology in classrooms?

2. Research Questions

- A. Comfort Level

- i. What is the perspective of middle level classroom teachers when using technology in a classroom setting?
 - ii. What is the perspective of middle level principals when observing technology use in the classroom?

- B. Technology Limitation

- i. What perspectives do middle level teachers have about themselves with regard to the limitations they have concerning true technology integration in the classroom?
 - ii. What perspectives do principals have in regard to the limitations they have concerning true technology integration in the classroom?
 - iii. What are the limitations that middle level teachers and principals perceive that prevent true technology integration in their classrooms?

- C. Use of Technology to Promote Achievement

- i. What contributes to middle level teacher engagement in the use of technology to promote academic achievement?
 - ii. What perspectives do principals have that contribute to middle level teacher engagement in the use of technology to promote academic achievement?

Setting for the Study

A mixed-method study will be conducted through the use of an Internet-based quantitative survey and qualitative interviews of randomly selected middle level teachers and principals from Morris County, New Jersey.

Significance of the Study

There is limited research on the perspectives, comfort levels, and limitations related to technology use by middle school teachers. Determining the factors that enhance or may limit technology integration in the middle school curricula may help stakeholders to make decisions that will increase the use of technology in a more active, concerted, and useful manner for students in a middle level setting. With students growing up as digital natives (Bennett, Maton, & Kervin, 2008), capturing teachers' perspectives, comfort levels, and limitations of the use of technology may elicit a deeper understanding of whether there is a disconnect and communication barrier that is growing in middle level classrooms (Prensky, 2001).

Definition of Terms

The following definitions are related to this study:

Digital Immigrants—A term referring to people who were born before the use of computers in society (Prensky, 2001).

Digital Native—A term referring to people who were born and have grown up using computers and technology (Prensky, 2001)

Educational Technology—Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources (AECT, 2004).

Integrated Technology—The act or instance of combining technology into an integral whole of the lesson or educational activity.

Interactive Whiteboard—An interactive display that connects to a computer and projector.

Laptop—A personal computer with the capability of being mobile.

Middle School—A school intermediate between elementary school and high school, usually encompassing grades five or six through eight.

National Technology Standards—are the standards for learning, teaching, and leading in the digital age and are widely recognized and adopted worldwide.
(International Society for Technology Education, 2013)

Professional Development—The term “professional development” means a comprehensive, sustained, and intensive approach to improving teachers’ and principals’ effectiveness in raising student achievement (National Staff Development Council, 2012).

Smartphone—A mobile phone that offers advanced computing and ability to connect to various networks.

Social Networks—A network is comprised of individuals or organizations that are connected to one or more types of interests, media, or experiences.

Technology—The set of tools, both hardware and software, that help us act and think better. Technology includes all the objects from a basic pencil and paper to the latest electronic device.

Assumptions

The focus of this study is strictly on middle level teachers and principals in grades six through eight in public schools in Morris County, in the state of New Jersey. Within the state of New Jersey, teachers and principals have many opportunities to take advantage of professional development workshops and courses in the area of educational technology. Most teacher preparation programs at the college undergraduate level include coursework in the area, and the state offers free programs focusing on 21st century skills. With the release of the newly piloted state teacher evaluation instrument and the Professional Teaching Standards, teachers are now required to incorporate technology in the classroom experiences of the students under their charge (New Jersey Department of Education, 2010a). This study focuses on the teachers' perspectives of technology, their comfort levels and limitations in using technology, and factors that contribute to the use of technology by middle school teachers and principals. The data received will help clarify the present research to enlighten educational stakeholders when making decisions concerning educational technology and classroom instruction.

Study Limitation and Delimitation

There are some delimitations and limitations to this research study. The study is limited in its findings in the following ways:

1. The subjects of this study are delimited to middle school teachers and principals.
2. The study takes place only in Morris County, New Jersey.
3. It is assumed that all respondents will answer accurately and honestly.

The study is delimited in its finding in the following ways:

1. There is no way to control for the access to computers and time to complete the study once it is released to the teachers by the principal.
2. There is no way to control if teachers take the survey alone or in groups.

Researcher's Biases

This study will use a mixed method approach, including both quantitative and qualitative research data to inform and guide the study. The researcher has a keen interest in technology and has been instrumental in bringing a vast array of technological advances to several districts in the state of New Jersey. Bias may be present in aspects of the research. As part of the quantitative development process and application of the questionnaire, and to eliminate potential of bias the researcher had all documents reviewed by professionals in the field that will help to validate the questions and steer the researcher away from any preconceived notion. The selection of middle schools in Morris County, New Jersey will incorporate a variety of urban, suburban, and rural districts with varying demographics, thus preventing the researcher from selecting districts with a dedication to advancing technology programs.

Summary and Organization of the Study

The purpose of this mixed method study is to examine middle school teacher and principal perspectives on the use of technologies in their academic setting. Specifically, the research will look at teacher engagement and implementation limitation related to the use of technology in the educational environment of middle school students.

This dissertation contains six chapters. Chapter One introduces the study, which includes the problem, purpose, significance of the study, term definitions, limitations/delimitations, possible biases, and this summary. Chapter Two reviews the

literature connected to middle level teachers and technology use. Chapter Three describes study methodology, the study and research design, the collection process and procedures, analysis of the data, and verification methods. Chapter Four provides a more complete analysis of the quantitative data, Phase I and findings. Chapter Five, Phase II will contain interview summaries and findings for the qualitative data. Chapter Six will include a discussion and conclusion formulated by the researcher through the study.

Chapter Two

Review of Literature

There is a great deal of research on the use of technology in education, but very little research exists on the use of technology by teachers in middle school settings. To facilitate an understanding of the use of technology in the middle level classroom, it is valuable to review appropriate literature focusing on:

1. a history of educational technology in the classroom,
2. the availability of technology in the classroom,
3. limitations to the use of technology by teachers,
4. the middle level school environment, and
5. technology standards in public education.

History of Educational Technology

Although technology manifests itself in several forms, the evolution from the mid to late 20th century of computers and/or technology in education will be the focus of this section. The beginning of technology with computer use in the classroom dates itself back to the 1960's when universities such as Harvard employed computers with students to collate data and batch information, but the process was cumbersome and lengthy. Emerging from the need for simplicity and a faster way of collecting data, the BASIC computer language was created and computing became more accessible to students (Suppes, 1980). Since the development of easier access to computers, the use of technology has excelled significantly, and as of 2008, there were three students to every one computer in public schools as compared to seven students to one computer in 2000 (National Center for Educational Statistics, 2010). In the early 1970's, Apple Computer

began donating Apple 1 model computers to schools, and the face of personal computer use in education began to change in public schools (Murdock, 2011). Along with the use of the personal computers in the classroom has come an increased use of the Internet, which a decade ago was still not available in all schools. By 2008, 94% of schools in America had Internet access (National Center for Educational Statistics, 2010). Computer usage continued to grow rapidly throughout this era with 34% of teachers surveyed saying they were using technology for administration and the Internet “a lot.” Less than 10% of teachers surveyed indicated that they were accessing technology for self-research or model lesson plans (National Center for Educational Statistics, 2010). With the rapidly advancing technologies from the 1980’s onward, and innovations such as The Internet Browser in 1992, Email in 1993, MP3 players for digital music in 1996, Google Search Engine in 1998, Wi-Fi in 1999 (GCN Staff, 2007), cell phone technology expansion and tablet technology in 2010, teachers were inundated with a plethora of devices and methods from which to select to deliver concepts and skills to the students in classrooms. Although these innovations have been accepted in general, Zhao, Pugh, Sheldon, and Byers (2002) found that many educators still remained pedagogically unsophisticated in technologies related to curricular areas of instruction. Over a 20-year period of time focusing on educational technology policies, Culp, Honey, and Mandinach (2003) described a disparity between educational leaders’ visions for technology integration and how most educators use technological tools. Leaders emphasized technology uses that supported investigation, collaboration, and improved practice, while many teachers were inclined to center on using presentation software, student-centered websites, and management programs to improve existing practice (Culp et al., 2003).

Though conventional teaching methods often dictate the pace and delivery of the instructional concepts and skills, technology tools make available a wide variety of methods that allow for student engagement in the learning process. All students can find ways to achieve success when learning at an individual rate, and interest. A well-designed, developmentally appropriate computer curriculum can help assure that all students can acquire skills when they need them (Pflaum, 2004).

With the advent of high stakes assessments due to political regulations such as “Race to the Top” (RTT) (U.S. Department of Education, 2010) initiated by the Obama administration, new levels of student achievement and teacher accountability in public schools is looming in the near future. The recent third phase of RTT focuses on “Science-Technology-Engineering-Mathematics” (STEM) classes, which include specific topics for grade levels in the fields of science, technology, engineering, and mathematics (U.S. Department of Education, 2011) and exposes more students to higher levels of concepts and skills to fill the gap of workers in these areas.

Availability of Technology

In order to meet the requirements, RTT educators are looking for initiatives that can help them close the gap and achieve the required benchmarks. From use of laptops through tablet technology, some districts have incorporated technologies that support the learning goals with the hope of positive academic achievement. Studies on the use of laptop computers, especially with dedicated purposes, suggest that students may be more engaged in the learning process and thus have high achievement in mastering skills and concepts (Gulek & Demirtas, 2005).

The impact of technology on students in schools continues to be cited through several studies that support the infusion of technology in the learning process. One such study developed in the year 2000, commissioned by the Software and Information Industry Association, by Sivin-Kachala and Bialo (2000) reviewed hundreds of research studies on how technology affects student achievement. Findings revealed positive and steady patterns where students were engaged in technology-rich settings, including considerable gains and accomplishments in all subject areas, increased achievement in pre-kindergarten through high school for both regular and special needs students, and enhanced attitudes toward learning and improved educational confidence (Sivin-Kachala & Bialo, 2000).

Statistical information from the National Center for Education Statistics indicated that by 2008, 94% of schools had access to the Internet and computers with a ratio of three students to every one computer (NCES, 2010). Upon bringing computers and the Internet into the schools, many educational institutions developed initiatives that isolated computer use to specific classrooms where students cycled through the classes and teachers had limited access to the computer room. As the use of computers escalated, schools began to develop different models concerning exposure to computers. Such models included classroom computer stations and more recently laptops in carts, commonly known as COWS, Computers On Wheels; but still in some cases, computers are only available through the use of a specific area in the school such as the computer room or library/media center. If, in fact, technology is not available on an as needed basis, what can we say about the use and availability of technology for teaching and making connections to concepts and ideas through the selection of the teacher?

Teachers in some studies have indicated that although they believe in using technology as a positive vehicle in the learning process, natural barriers exist, and that they do not use technology often or well (Staples, Pugach, & Himes, 2005). Rogers (2000) indicated from a collection of studies that the following barriers continue to plague teachers in elementary and secondary schools: availability and quality of hardware/software, faculty role models, funding, institutional support, models for using technology in instruction, staff development, student learning, teacher attitudes, technical support, and time to learn to use technology. The presumption that educators use the tools that are available may be a false supposition.

Limitations and the Use of Technology

Selected qualitative and quantitative research, which has been conducted by digging deep into the issue of limitations related to the use of technology in the middle level classroom, is noted somewhat in the literature. One study by Palak and Walls (2009) used a mixed-methods approach to address this topic. Palak and Walls (2009) found that the teachers reported a positive use of computers to promote student-centered learning, individual instruction, and independent learning. The same group also felt this type of instruction promoted independent learners, allowed for individualized instruction, and could be used as a motivator (Palak & Walls, 2009). While this study begins to look at the issue from an initial perspective it still leaves the areas of limitations and engagement unclear. Research has revealed attitudes and perspectives by teachers categorized as elementary or secondary, and also by pre-service configurations (Anderson & Dexter, 2005; Asan, 2003), but lacks specific reference to middle level education. A finding in research with pre-service teachers indicated that certain

pre-requisites exist in order to prepare teachers to use technology. Those pre-requisites included: support of friends, confidence level, and the use of technology in the institution (Teo, Lee, & Chai, 2008). What if a parameter such as support of a friend does not exist in the school setting? Teachers work many times in isolation, and unless planned time is made for them to access a colleague, support may be limited to before and after school hours. In the late 1990's Gay (1997) revealed that teachers in elementary schools found that the use of computers in the classroom focused on student work, making the experience more student centered and less teacher centered, and that students were actively engaged and not passive during the learning process. At the same time teachers believed that technology integration was a process of years and not months (Gay, 1997). Secondary school teacher attitudes also demonstrate a unique perspective. In an early study by Rosen and Weil (1995), the research indicated that secondary teachers were avoiding computers even if they were available, primarily due to lack of confidence in using the computer (Russell & Bradley, 1997). Twelve years later Cuban, Kirkpatrick, and Peck (2001) found that although teachers were using computers, the slow revolution of technology at the high school level was apparent, and that daily use of technology was limited to the few. With continued focus on primary and secondary schools, and limited research being grade configured K – 8 or 9 – 12, and with the advent of middle level education, it is critical to examine the comfort level of professionals using technology in middle level education, the limitations they place on themselves or others when using technology, and what contributes to the use of technology by middle level educators. With more than 1,344,000 teachers employed in our nation's secondary schools, which

include middle level teachers (United States Census Bureau, 2012), there is a need to address this population of educators.

Middle school students pose a unique challenge to educators when it comes to academic instruction. Students deal with issues such as independence, moving from elementary school to middle school, a shift in responsibilities, and a change in expectations. Given that we are driven by a society that continues to make advances in the area of technology, these issues and the use of technology directly impact students at this academic level. Students use technology on a daily basis for personal use and are extremely proficient in using newer technologies (Phillips, 2009); therefore, it makes sense to incorporate this interest into the middle school academic curriculum. This allows for various modalities of instruction, such as kinesthetic activity, and may promote academic understanding at the middle school level (Phillips, 2009).

The advancement in technology continues to play a critical role with student populations, and has changed the way academic curriculum is delivered; however, previous studies (e.g., Chau & Hu, 2001; Venkatesh & Davis, 2000) have indicated that using technology has not been well-received by people in all employment settings. Therefore, it is necessary to understand why teachers who have access to a variety of technologies choose to use methods that do not incorporate the use of technology. While prior research has examined pre-service, elementary, secondary, and post-secondary teacher perspectives, little evidence exists on middle school teacher perspectives on the use of technology in the academic setting.

The investigation of teachers' struggles with technology integration dates itself back to the early 1980's when researchers such as Art Botterell (1982) believed that the

American education institution was well established, along with methodologies that are deeply engrained in the teaching system, and that technology practices may be viewed as being in direct conflict with the current instructional techniques (Botterell, 1982).

Almost 30 years later McREL (Mid-continent Research for Education and Learning) indicated that after reviewing two sets of data and interviewing and observing hundreds of teachers, observers reported that in 63% of all observations teachers utilized no technology at all, even if the technology was present (Pitler, 2011). With this information at hand, continued investigation indicates that research continues to find that although technology was provided for the use of teachers and students, the choice to limit the use of technology remained consistent (Pitler, 2011).

Lack of the use of technology by teachers in the classroom continues to home in on three major areas of concern; time, access, and acquisition of skills (Gay, 1997). These areas are consistent with prior research that supports both elementary and secondary school findings, but lack the specific results from middle level professionals. Possibly the reason why literature on the topic might be scarce on middle level professionals' use of technology is due to the coincidence that the middle level concept and the advent of technology grew together (Manning, 1997). Nevertheless, successful teachers who achieve good results with their own tools ask why they should convert to different methods given the lack of sufficient evidence to support better achievement (McKenzie, 2004).

Time for instruction is the eternal complaint of teachers universally. Whether at a faculty meeting or in the lunchroom, teachers continually focus on time as an issue for the delivery of content and skills. When asking teachers to infuse the use of technology as

part of the classroom experience, is it not natural that the same mantra will emerge? Liu and Huang (2005) discovered that even pre-service teachers had high concern for the amount of time necessary to prepare materials and learn integration techniques to bring to the classroom, but that attitudes toward the use of technology in the instructional environment changed if the pre-service teacher perceived a sense of usefulness through the use of the computer. Does this hold true for the professional middle level educator? Constraints on time have also been connected to time for learning how to use technologies for classroom experiences. An example of this is shown with secondary schools mathematics teachers who were not only concerned with their own abilities to learn and incorporate technological methods in the classroom, but who were also concerned with the amount of time students would need to learn to use the technology. The perceptions of teachers' use of time can often cloud the judgment of the teacher as to the intention to use technology in the classroom (Pierce & Ball, 2009).

Continuing research on secondary level social studies teachers and their use of technology revealed several external impediments to the use of technology, which included the lack of sufficient computers, time, and Internet access in classrooms. These items remained as a stumbling block to the infusion of technology in instructional practices (Shriner, Clark, Nail, Schlee, & Libler, 2010). Can the perspective of time as a force to prevent infusion of technology in the classroom then add to overall lack of use?

The second area of concern indicated by Gay (1997) was that teachers lacked access to technology. Although technology has grown exponentially in recent years, the question still remains does access to availability continue to add to the struggle of use of technology as a common method in the classroom (Liu & Huang, 2005)? The question

still needs to be answered concerning teacher and student access to the actual equipment. With shrinking budgets and limited sources of funding, are schools keeping equipment available for students and teachers? Technology access is not limited to the school setting, and some teachers are reticent about using technology because of the perception that students lack technological access beyond the school (Park & Ertmer, 2008). For some educators the perception of student access at home is focused on financial circumstances, and thus an equity issue arises for some students. Teachers working with underprivileged students viewed inability for students to use technology at home as a barrier to incorporating the technology in the classroom. The common perceptions were focused on the financial consideration to access technology beyond the school (Pierce & Ball, 2009).

The Middle Level School Student

Middle level students can often be equated to a seesaw in the park. One day the students are up, focused and on task, and the very next day they are down, feeling gloomy and forgetful. Is this observation a coincidence? Why should the middle level teachers' expectations be different from elementary and secondary teachers, and what describes the middle level school environment? Early adolescence has been investigated for over one hundred years. As early as 1904, G. S. Hall, proponent of schools for younger adolescents, published a four-volume document focusing on teenage years. Hall (1904) developed a construct that identified several areas in adolescent growth process. These areas included: biology, psychology, social relations, and their effect on family peers, and school. Eighty-four years later developmental psychologists such as Conrad Toepfer (1988) measured the abstract thinking abilities of students ages 11, 12, 13, and

14. His research indicated that only 24% of 14-year-old students in this age grouping could think abstractly. He also suggested that instruction needed to be more concrete, with a physical approach to learning through tactical or hands-on experiences (Toepfer, 1988). With the expansion of research into adolescent psychology and the development of learning strategies that incorporate kinesthetic experiences, it might seem natural for teachers to incorporate interactive white boards, smartphones, and laptop computers. Students assigned to characteristic middle level classrooms represent a range of abilities and learning modalities. They have various strengths, motivation, and personal skills that they bring to the classroom. In the middle level years this process is accelerated by differing developmental changes and reasoning ability, which create an environment where some students are capable of complicated thinking and critical thought while others are just developing such skills (Piaget & Inhelder, 1969). These complexities create challenges for teachers as they attempt to create learning environments that support these varied learners.

By giving students choices in the educational process and by including active learning projects in the classroom, teachers have a greater chance of increasing students' engagement and motivation for learning (Meyer, 2007). Meyer (2007) further found that in one-to-one laptop programs there were strong indications of increased motivation for learning; achievement, attendance, and discipline were all impacted by the active learning projects used through the technology at hand. By using multi-layered projects that have differing levels of ability designed into the construct of the assignment, teachers may have a better chance of activating learning for students assigned to their classroom (Nunley, 1996). Addressing the developing young adolescent in the classroom is a

complex and dedicated process (Maday, 2008). The maturing mind of a middle level student may or may not grasp the information and skills at hand. The insightful teacher understands that engaging students in active learning may enhance the ability of some students to process and retain the skills and concepts associated with the instructional objectives. The physical, psychological, and social development of middle level learners often help to define the environment in which they are schooled. This schooling, enhanced or not by the use of technology, may be limited by the choices that teachers make when designing classroom lessons.

Technology Standards in Public Education

Educational standards were designed to advance the academic development and achievement of every student in public schools by outlining the knowledge and skills that students should acquire and be proficient in for each curricular area and each grade level. In addition to these various academic standards, national educational technology standards for students have been developed and adopted by many states. In 1993 the International Society for Technology in Education (ISTE) released technology standards for students, which included six general standards categories: (a) basic operations and concepts; (b) social, ethical, and human issues; (c) technology productivity tools; (d) technology communications tools; (e) technology research tools; and (f) technology problem-solving and decision making tools (ISTE, 2007). Four years later in 1997 ISTE revised the national standards and categorized the eighteen indicators into three categories: Basic Computer Operations and Concepts, Personal and Professional Use of Technology, and Application of Technology in Instruction. Reflecting on the continued growth of technology and the impact on teachers in the classroom ISTE again revised the

standards for teachers in 2000, including 23 indicators in 6 categories. The categories were renamed and published as: Technology Operations and Concepts, Planning and Designing Learning Environments and Experiences, Teaching, Learning and the Curriculum, Assessment and Evaluation, Productivity and Professional Practice, and Social Ethical, and Human Issues. Over the past decade ISTE has sought the input of stakeholders to develop national standards that are recommended not only for students and teachers, but also in 2009 included standards for administrators, 2011 standards for technology coaches, and also in 2011 standards for computer science teachers (ISTE, 2011). For the purpose of this study two areas of standards are listed, standards for teachers and standards for administrators. The most recent technology teacher standards include the following:

Standard One: 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.

Standard Two: 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 National Education Technology Standards for Students.

Standard Three: Model Digital Age Work and Learning

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

Standard Four: 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.

Standard Five: 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.

The most recent technology standards for administrators include the following:

Standard One: Visionary Leadership

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

Standard Two: 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.

Standard Three: 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.

Standard Four: Systemic Improvement

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

Standard Five: Digital Citizenship

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

New Jersey has utilized the ISTE standards as the catalyst for the state technology standards, and all though New Jersey may base the state technology standards on the national standards (New Jersey Department of Education, 2010b), levels of technology

implementation are divergent due to the priorities that each district may include in the teacher requirements for a successful classroom experience. With standards in place and expectations set by the state and districts through evaluation systems, the question concerning teachers' and principals' perspectives of technology in the middle school classroom still needs to be answered. For this study perspectives of teachers are linked to three of the national standards: (a) Design and Develop Digital Age Learning Experiences for Students, (b) Model Digital Age Working and Learning, and (c) Engage in Professional Growth and Leadership. Selection of these three standards ties directly to the research questions focusing on comfort levels, limitations, and academic achievement. Having a specific perspective that leads to design and development of digital experiences, modeling digital age working environments, or professional learning experiences, teachers may be able to translate the connection of student experiences in the middle level classroom to student learning and achievement. Although important, standard one and four are not considered in this study, since they focus on a teacher's subject knowledge, and ethical issues concerning technology, topics that are not aligned with the research questions. Interestingly, The Pew Internet and American Life Project studies indicates that educators, who perceive themselves as personal technology users, have not translated that use into their class lessons or activities. Students report that their use of technology occurs mostly outside of the school day (Levin, Arafeh, Lenhart, & Rainie-Director, 2002).

For the purpose of this study two national technology standards were selected that correlated to the research questions concerning principals: Standard One: Visionary Leadership and Standard Three: Excellence in Professional practice. For principals,

standard one focuses on Visionary Leadership. In a digital world it is important to understand the perspective that the principal brings to the table concerning technology in the classroom? In addition standard three focuses on Excellence in Professional Practice and how the principal promotes an environment of innovation that empowers educators to enhance student learning using contemporary technologies. Therefore, how has the perspective of the principal influenced the classroom experience of students through the interactions of teachers?

Summary

Existing literature indicates that technology has grown exponentially over the past two decades. With technology use in the classroom there are positive outcomes that may be available to students when technology is infused in the content curriculum. Although accessibility, professional development, and interest have increased, the question of the use of technology and integration in the classroom experience still remains. Consistent research in adolescent psychology continues to support the need for developmental activities that address the ever-changing middle level adolescent. In addition to the current curriculum in schools, national technology standards for teachers and administrators (ISTE, 2011) have been established. These standards set the bar for states and districts to establish goals and outcomes for teachers and administrators in the area of technology implementation. Additional information can be found in Appendix concerning websites and articles that the reader may find of interest concerning these topics. Chapter Three discusses the methodology that was used in this study.

Chapter Three

Methodology

A mixed-method study was conducted through the use of a quantitative Internet-based survey and qualitative interviews of randomly selected middle level teachers and principals from Morris County, NJ. This mixed method design was chosen for the reason that

mixed-method research involves collecting, analyzing, and integrating (or mixing) quantitative and qualitative research (and data) in a single study or a longitudinal program of inquiry. The purpose of this form of research is that both qualitative and quantitative research, in combination, provides a better understanding of a research problem or issue than either research approach alone. (Creswell, 2008b, p. 20)

Information on the research design, participants, data sources and collection methods, validity of the data, and procedures are found in this chapter.

Purpose Statement

This study aimed to examine middle school teacher and principal perspectives on the use of technologies in their academic setting. Specifically, it aimed to look at middle level teacher engagement and implementation limitation related to the use of technology in the educational environment of middle school students.

The overarching questions that lead this study were as follows:

1. The Central Question
 - A. How do middle level teachers and principals perceive the use of technology in classrooms?
2. Research Questions
 - A. Comfort Level

- i. What is the perspective of middle level classroom teachers when using technology in a classroom setting?
- ii. What is the perspective of middle level principals when observing technology use in the classroom?

B. Technology Limitation

- i. What perspectives do teachers have about themselves with regard to the limitations they have concerning true technology integration in the classroom?
- ii. What perspectives do principals have about teachers in regard to the limitations they have concerning true technology integration in the classroom?
- iii. What are the limitations that middle level teachers and principals perceive that prevent true technology integration in their classrooms?

C. Use of Technology to Promote Achievement

- i. What contributes to middle level teacher engagement in the use of technology to promote academic achievement?

Phase I: Study Population for the Quantitative Survey

Phase I of this study used a survey to answer the following global question: How do middle level teachers and principals perceive the use of technology in classrooms?

The participants consisted of teachers and principals from middle level schools in Morris County, New Jersey, grades six, seven, and eight, with the matching demographic standing of “A, B, C, D, E, F, G, H, I, or J” as designated by the District Factor Grouping

(DFG) criteria established by the New Jersey Department of Education (NJDOE, 2004).

The District Factor Grouping uses the following information to create the DFG:

1. percent of adults with no high school diploma,
2. percent of adults with some college education,
3. occupational status,
4. unemployment rate,
5. percent of individuals in poverty, and
6. median family income.

Morris County has 29 middle schools, with approximately 736 teachers and 29 principals. Contact information for the participants was available through local educational institution websites, which listed the email contact, grade level(s), and or subjects taught for the participants. The sample will be the entire teacher and principal population.

Using the variables of District Factor Grouping (DFG), gender, age, teaching experience, exposure to technology in high school, undergraduate coursework, graduate coursework, grade level assignment, and highest level of degree attainment in the quantitative method, it was the researcher's intent to examine any correlation between the above mentioned variables, and possible impact on teacher and principal perspectives on technology in the middle level classroom.

Description of the survey. The Internet survey was selected for the purposes of ease, anonymity, time constraints, and processing of the information. There are several benefits to Internet surveys, but most importantly they can be attractive to both the respondent and the person conducting the survey (Evans & Mathur, 2005). Internet

surveys can be fun to complete because the developer can make them interactive. Evans and Mathur (2005) indicated that online surveys have significant advantages to traditional paper surveys, with strengths focusing on issues such as ease of data entry being automatic, cumulative analysis, and flexibility. Along with these elements online surveys allow the developer to mark trends as the data is recorded. The authors focused on the weaknesses of Internet surveys and indicated that these types of surveys may have concerns such as clarity, program unfamiliarity, and privacy to mention a few concerns, but proposed remediation steps can be put in place to control for these weaknesses (Evans & Mathur, 2005). Furthermore, Wright (2005) proposed that online surveys support an array of options not offered to traditional paper surveys, which include but are not limited to: a unique study population, time to complete and collect data, and cost. Disadvantages included sampling concerns with incorrect information, and deletion of the survey invitation or misplacement in the system. Wright (2005) believed that some of these conditions are plausible in the traditional paper survey as well.

It is the presumption of the researcher for this study that the selected individuals for this survey all had access to the Internet, either at work or at home. In addition, it is further assumed that the educators in all schools, having access to email technology, have a basic understanding of the use of the Internet. An issue with the Internet survey can come up when lack of monitoring takes place during the actual completion of the survey, but with IP address cookie data, we know that only one response can be programmed per person. Unfortunately, if more than one person uses the same computer the cache will need to be emptied so a new respondent can complete the survey. This may reduce the number of respondents if access to computers is limited. In today's fast paced educational

field, where teachers and principals feel overwhelmed and short of time, the Internet survey may be the most assured way of collecting perceptual data concerning technology use in middle schools primarily due to the large quantity of papers, reports, and administrative tasks that teachers and principals must complete each day. In addition, reminders concerning the survey can be sent, and data collection is swift and convenient. The survey for this dissertation was configured to collect data to answer the central question: How do middle level teachers and principals perceive the use of technology in classrooms? The survey was constructed using Survey Monkey, an online survey system, and included nine demographic questions:

1. "Select one category. Teacher. Principal."
2. "What is your gender?"
3. "Which category below includes your age?"
4. "How many years have you been teaching?"
5. "I used technology (computers or internet) in high school."
6. "I used technology (computers or internet) in my undergraduate coursework."
7. "I use or used technology (computers or internet) in my graduate coursework."
8. "Grade Level (Select the level(s) you have the greatest instructional contact with in the school setting."
9. "What is the highest level of school you have completed or the highest degree you have received?"

The researcher believes that by adding the demographic questions the data may reveal perspective differences by the categories of position, gender, experience in the field,

use of technology in previous coursework, grade level association, and advanced studies.

Correlation of survey questions to research questions and technology

standards. The questions in the quantitative study have been correlated to the research questions for this study as well as to the national technology standards to substantiate the relationship between the data being collected and the research questions and standards. Table 1 indicates the association between the research questions and the survey questions.

Administrative procedures. The first planned administration of the survey and interviews took place between February 11 – March 23, 2013, following the approval of the study by dissertation committee and the University of Nebraska - Lincoln Institutional Review Board. The Internet survey was expected to take approximately nine minutes to complete. Permission letters were sent to school districts for Superintendent of Schools approval to conduct the survey at the middle school level prior to activating the survey, if necessary. Not all Boards require an approval if the survey was completed by adults. All study procedures were pre-approved by the local educational agency and the University of Nebraska – Lincoln’s Institutional Review Board. Following the approval of the study an email was sent to middle level principals, which encouraged teachers and the principals to participate in the survey. Finally, a reminder email was sent to the building principal as a follow up and reminder to encourage all invited participants to respond to the survey. The survey was opened from February 11, 2013, through March 23, 2013.

Table 1

Association between the Phase I Research Questions and the Survey Questions

Research Questions	Correlated Survey Question By Number (Appendix A)	Correlated Survey Question By Number (Technology Standards)
A. i. What is the perspective of middle level classroom teachers when using technology in a classroom setting?	11, 13, 15, 16	2 – teacher standard
A. ii. What is the perspective of middle level principals when observing technology use in the classroom?	11, 13, 15, 16	1, 3 – administrator standards
B. i. What perspectives do middle level teachers have about themselves with regard to the limitations they have concerning true technology integration in the classroom?	8, 9, 10, 11, 12, 13, 15, 16	3 – teacher standard
B. ii. What perspectives do middle level principals have about teachers in regard to the limitations they have concerning true technology integration in the classroom?	3, 4, 5, 6, 7, 8, 9, 11, 13, 16, 17	1 – administrator standard
B. iii. What are the limitations that middle level teachers and principals perceive that prevent true technology integration in their classrooms?	8, 10, 11, 13, 16, 17	3 – teacher standard
C. i. What contributes to middle level teacher engagement in the use of technology to promote academic achievement?	2, 12, 13, 14, 15, 16, 17	1, 2, 3 – teacher standards 3 – administrator standard
Demographic Questions	1, 18, 19, 20, 21, 22, 23, 24	

Reliability and validity. The initial survey was reviewed by colleagues who understand the field of educational technology to assess if the information being asked in the questions was valid and plausible to use to gather data concerning the topic (Merriam, 2009). Professional technology educators and peers in the field of education vetted the survey for content. It was important to have a peer review process in place in order to

view and comment on the survey prior to its use. The researcher also included a pilot survey to ascertain comments from a small group of respondents, $n = 15$, in order to mark the survey for areas such as, poor wording, responses that make little sense, or excessive time to complete the survey (Creswell, 2008a). Adjustments were made if necessary, and the survey was distributed electronically to middle school teachers and principals February 11, 2013.

Phase II: Qualitative Research

Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The research builds complex, holistic pictures, analyzes words, reports detailed views of informants, and conducted the study in natural setting. (Creswell, 2008b, p. 15)

Creswell (2009) further explains that it is “a means of exploring and understanding the meaning of individuals or groups ascribe to a social or human problem” (p. 4). Opinions are personal and often are tainted by a person’s reality. Through the use of open-ended questions the interviewer collated information to seek an understanding of the questions at hand. The researcher developed questions and used the questions to focus teacher and principal interviews. Qualitative data was collected in six middle school settings that were single middle schools, part of districts serving students in grades pre-kindergarten through twelfth grade or pre-kindergarten through eighth grade. The middle schools consisted of students in grades six through eight, serving populations between 250 – 1,200 students. The interview questions were divided into two categories, Demographic Questions and Technology Questions. The questions contained in the demographics category were designed to collect data for comparison purposes. It was the intent of the researcher to associate the common or uncommon responses based

on experiences in education, as well as any correlation between technology perspectives and levels of education.

Study population for the qualitative study. Phase II participants included four middle school principals and six middle school teachers, who identified themselves in the quantitative survey by ranking the value they placed on technology as an instructional tool as either “valuable” or “very valuable” in survey question number 11. Question 12 included a response to question 11, and a field to enter participants’ email addresses as a form of contact in order to initiate the qualitative interview process. The interview took place pending the participant reading and agreeing to the informed consent. In order to collect data purposefully the researcher selected a limited number of participants in order to gather information-rich responses central to the importance of the inquiry concerning technology perspectives in the middle school setting (Merriam, 2009). The researcher endeavored to include participants in the qualitative interview process who varied in district factor grouping as defined by the New Jersey Department of Education in order to obtain insight from teachers and principals who may work in less than affluent districts through more affluent districts. The purpose of trying to include a variety of teachers and principals was to learn if there was a common connection between the positive stories that allow for success with technology in middle level classrooms other than being classified in a specific category within the District Factor Grouping such as income, poverty level, or educational level.

Correlation of interview questions to research questions and technology standards. The questions in the qualitative study were correlated to the research

questions and selected national technology standards for this study to substantiate the relationship between the data being collected and the research questions. Table 2

Table 2

Association between the Phase II Research Questions and the Survey Questions

Research Questions	Correlated Survey Question By Number (Appendix A)	Correlated Interview Question By Number (Technology Standards)
A. i. What is the perspective of middle level classroom teachers when using technology in a classroom setting?	5, 7, 9, 11, 12	2, 3 – teacher standards
A. ii. What is the perspective of middle level principals when observing technology use in the classroom?	5, 7, 9, 11, 12	1, 3 – administrator standards
B. i. What perspectives do middle level teachers have about themselves with regard to the limitations they have concerning true technology integration in the classroom?	6, 9, 10	2, 3 – teacher standards
B. ii. What perspectives do middle level principals have about teachers in regard to the limitations they have concerning true technology integration in the classroom?	6, 9, 10	1, 3 – administrator standards 1 – teacher standards
B. iii. What are the limitations that middle level teachers and principals perceive that prevent true technology integration in their classrooms?	9, 10	1, 3 – administrator standards
C. i. What contributes to middle level teacher engagement in the use of technology to promote academic achievement?	8, 11, 12	1, 3 – administrator standards
Demographic Questions	1, 2, 3, 4	

indicates the association between the research questions, selected national technology standards and the survey questions.

Administration procedures. The researcher used a semi-structured interview approach. Participants were given a copy of the informed consent document, and

instructed to read the text and had the opportunity to ask any questions related to the contents of the document. All individuals agreed to participate, and signed the informed consent; the interview process was then started. Interviews were conducted with principals and middle school teachers during one setting and lasted approximately 30-45 minutes. Using a semi-structured interview approach, all 12 questions were asked of each participant.

The interviewer recorded the interviews. The interviewer stated the date and start time of the interview. Gender of the participant was noted prior to starting the interview. The questions were asked in the following order:

Demographic questions.

1. What is your current position in the school?
2. How many years have you been in this position?
3. How many years have you been teaching middle school?
4. What is your highest education level completed?

Technology questions.

5. Describe how you currently use technology in the classroom you are teaching?
6. What trainings have been instrumental in your continued use of technology in the classroom?
7. What value do you place on the use of technology as an instructional tool in the classroom? Why?
8. What specific role(s) do you see technology playing in the classroom for you? For students?
9. On a scale of one to five, with one being the lowest score of implementation and five being the highest score of implementation, where do you see yourself as an educator who uses technology as a common tool in teaching?

10. What limitations do you perceive as obstacles to including technology and integrating it into your classroom?
11. What allows you to implement technology more frequently and engage students in active learning?
12. Are you required to use technology in your current teaching position? How?

Reliability and validity. This study was based on a mixed method approach to determine educator perspectives on technology use. For the qualitative method a structured coding process was used in order to assess participant viewpoints on technology use. The researcher attempted to develop various themes based on the data about why educators may or may not perceive that they use technology based upon the data gathered in the interviews.

The greatest concern lies in the difference between the actual information provided regarding what teachers and principals know about the availability of technology, professional development, and self-reporting in the school district in which they work, and the person's perspectives of themselves and the use of technology in their school and classroom. Since subjectivity due to perspective will be considered in this survey, coding responses may be an important factor in final validity of the instrument and the use of the survey in research.

Summary

Chapter Three provided the purpose of the research, the relevant questions that guide the study, and the methods used for conducting and collating the information provided by the survey and interviews. The next chapter, Chapter Four, will present the findings of the Internet survey and the data collated from the qualitative interviews. Similar to Palak and Walls (2009) the researcher hopes that participants will identify in

some respect how teacher and principal perspectives and beliefs impact the implementation of technology in the middle school classroom setting.

Chapter Four

Phase I: Survey Results

Introduction

In the preceding chapter, the framework for determining the research methodology of this study were defined and delineated. This chapter describes the findings acquired through the data collected from selected middle level teachers and principals using the Internet survey.

The quantitative Internet survey included 25 questions, of which 8 questions were demographic in nature and with 17 questions centered on the purpose of the study. Personal identification was not collected unless the respondent decided that they would like to participate in the qualitative interview, and they placed their email address in the response section of question 12. Other than this identification there were no other ways to recognize which teachers or principals were represented from the Morris County, New Jersey middle level schools that participated in the data collection. The data collected and used in the study includes all responses, unless otherwise noted. Whenever possible, the teachers' and principals' interviews were selected from limited respondents, who were associated with different District Factor Groupings.

Survey Process

The quantitative survey was distributed to 11 school districts in Morris County, New Jersey of which 7 districts actually participated. In order to obtain a margin of error or confidence level, a sufficient number of responses were required. The confidence level was generally used as a descriptor for the reliability of the survey. The survey was opened for respondents to participate on February 11, 2013, and closed on March 23,

2013, with a total of 105 teacher and principal respondents of a possible 450, based on a 95% confidence level. With a confidence level of 95% the results of the survey are more likely to be reliable.

The districts that permitted participation included the following District Factor Groups: FG, GH, I, J, and represented educators working in middle level education, grades six, seven, and eight.

The following demographic information was collected and the breakdown indicates the variety of the sample found in this study.

Demographic Survey Responses

Respondents to the Internet survey included teachers and principals (Table 3).

Table 3

Middle Level Education Job Position

Question 1 – Select one category – Teacher or Principal.		
Teacher	Principal	No response
96(93.20%)	7(6.80%)	2

This result was anticipated due the nature of having one principal per middle school.

Respondents (Teachers and Principals) answered (see Table 4).

The following list indicates the respondents' age categories as indicated in survey (see Table 5)

Table 4

Respondents' Gender

Question18 – What is your gender?		
Females	Males	No Response
76(74.51%)	26(25.49%)	3

Table 5

Respondents' Age Range

Question 19 – Which category below includes your age?					
22-29	30-39	40-49	50-59	60-69	70-80
22(21.36%)	26(25.24%)	29(28.16%)	23(22.33)	3(2.91%)	0

There was a vast array of educational experience within the respondents (Teachers and Principals), which included the following categories:

Technology use by respondents in high school, undergraduate coursework, and graduate coursework showed that participants were closely aligned between using or not using computers or Internet in high school, but as they moved to undergraduate and graduate course work, sizeable numbers used computers or Internet as listed in Table 7.

Table 6

Respondents' Range of Years in Education

Question 19 – Which category below includes your age?	
Years in Education	# (Percent)
1-5 Years	21 (20.39%)
6-10 Years	22 (21.36%)
11-15 Years	20 (19.42%)
16-20 Years	19 (18.45%)
21-25 Years	7 (6.08%)
26-30 Years	7 (6.08%)
31-35 Years	4 (3.88%)
36-40 Years	2 (1.94%)
40-45 Years	1 (0.97%)
No Response	2

Table 7

Technology Use in High School, Undergraduate, Graduate Course Work

Question 21- I used technology (computers or Internet) in high school.			
Question 22 – I used technology (computers or Internet) in my undergraduate coursework.			
Questions 23 – I used technology (computers or Internet) in my graduate course work.			
	Yes	No	Unsure
High School	52 (52.49%)	46 (44.66%)	5 (4.85%)
Undergraduate Coursework	69 (66.99%)	32 (31.07%)	2 (1.94%)
Graduate Coursework*	68 (66.02%)	08 (7.77%)	3 (2.91%)

* 24 indicated Not Applicable

The following information was supplied concerning the degrees (see Table 8).

Table 8

Highest Academic Degree Earned

Question 25 – What is the highest level of school you completed or the highest degree you have received?			
Bachelor's Degree	Masters Degree	Doctorate Degree	No Response
32 (31.07%)	71 (68.93%)	0	2

Survey Technology Questions

In the area of available equipment in the classroom respondents indicated (see Table 9).

Table 9

Availability of Classroom Technology Equipment

Question 2 – Do you have classroom use of the following equipment (select all that apply).	
Equipment	# (Percent)
Desktop Computer	72(69.2%)
Interactive Whiteboard	87(83.7%)
Laptop Computer	64(61.5%)
Smart Phone	29(27.9%)
Tablet/iPad	38(36.5%)
Unsure	2(1.9%)
No Response	1

From those responding it is clear that between a desktop or laptop computer teachers and principals had significant access to this equipment in the classroom. An interesting response came with the Interactive Whiteboard, with 83.7% responding that they had access to this piece of equipment, but less had access to a computer, which is needed to run the Interactive Whiteboard.

The next question focused on access to equipment, not necessarily in the classroom. The researcher was interested to discover if teachers and principals had access to shared equipment in the school.

Table 10

Access to Technology Equipment

Question 3 – Do you have access to the following equipment (select all that apply).	
Equipment	# (Percent)
Desktop Computer	76(73.1%)
Interactive Whiteboard	94(90.4%)
Laptop Computer	86(82.7%)
Smart Phone	51(49%)
Tablet/iPad	66(63.5%)
Unsure	2(1.9%)
Other*	4
No Response	1

* Listed under “Other” were: flip camera, projector, and voice recorder.

With this question the data indicated that 21.2% of educators had more access to laptops within the school environment, but that a significant number of educators, 61.5%, had classroom access to laptop computers.

Ancillary equipment that supports technology in the classroom can include active response systems, active voters, or other handheld devices. The following describes the educators' response to having use of these devices and whether or not they have a full classroom set (25).

Table 11

Access to Supportive Devices for Active Boards

Question 4 – I have access to technology devices that work with the interactive white boards such as classroom voters or other handheld devices.				
Question 5 – If you answered yes to the previous question, do you have access to a full classroom set (25) or more?				
	Yes	No	Unsure	No Response
Question 4	80 (76.9%)	18 (17.3%)	6 (5.8%)	1
Question 5	63 (66.3%)	16 (16.8%)	16 (16.8%)	10

The above data indicates that many teachers had access or were aware of the technology devices, but 16.8% of educators were unsure if they had enough for a full classroom set of 25 or more.

The survey continued to assess what other technology tools teachers and principals had access to in the middle level grades. The data indicated a substantial collection of technology tools that were available for use.

Table 12

Access to Additional Technology Tools

Question 6 – I have access to the following technology tools (select all that apply).	
Technology Tools	# (Percent)
CD/DAD Burner	73(69.5%)
Digital Camera	90(85.71%)
Document Camera	56(53.3%)
Flatbed Scanner	55(52.4%)
Internet Access	104(99%)
Tablet	55(52.4%)
Video Camera (Flip)	68(64.8%)
No Response	0

In the area of professional development provided by districts, teachers and principals indicated that opportunity for professional development in technology at least once or twice a year were availed to the educators.

Table 13

Professional Development in Technology

Question 7 – My school or district offers periodic professional development (once or twice a year) in the area of technology or technology integration.			
Yes	No	Unsure	No Response
89 (86.4%)	9 (8.7%)	5 (4.9%)	2

Two questions were asked concerning teachers' and principals' perceptions on the limitations of technology in the classroom as described in the Purpose Statement. These

two queries address three of the research questions focused on technology limitation. The three research questions are:

- What perspectives do middle level teachers have about themselves with regard to the limitations they have concerning true technology integration in the classroom?
- What perspectives do principals have about the limitations they have concerning true technology integration in the classroom?
- What are the limitations that middle level teachers and principals perceive that prevent true technology integration in their classrooms?

Evidence indicates that a majority of educators responding to this survey are aware of the limitations of technology in the classroom. By linking questions 8 and 13 the researcher had the ability to detect that educators identified that there were limitations concerning technology and that the teachers and principals were able to list limitations concerning the use of technology in the classroom.

Table 14

Ability to Perceive Limitations of Technology

Question 8 – If given the opportunity could you list the perceived limitations of technology in the classroom?			
Yes	No	Unsure	No Response
83 (80.6%)	1 (1%)	19 (18.4%)	2

The list below shows the greatest percent or the most likely reason why technology may be limited in classroom use along with the Likert Scale number associated with the statement.

Table 15

Listing of Perceived Limitations

Question 13 – In rank order, with “1” being the least likely reason and “6” being the most likely, number the reasons why you feel technology may be limited in classroom use. Use each number only once.		
Reason	Greatest Response	Rating
Frequency of Professional Development	25 (24.75%)	5
Lack of Equipment	42 (41.58%)	6
Professional Development is not applicable to what I teach	24 (23.76%)	1
Takes too much time	30 (30%)	2
Unsure of results	28 (28%)	3
Unreliable	31 (30.39%)	1

Question 9 continues to explore the perceptions of teachers and principals as to their belief concerning middle level students and their ability to handle technology for educational purposes. The majority of educators felt that students could handle technology, but a significant number were unsure as to their students’ abilities (see Table 16)

Sixty-two percent of teachers indicated that they perceive their frequency of use of technology in the classroom to be at least three times per week, and as much as five times per week. A significant amount of teachers indicated that they used technology at least three times or more in the classroom as indicated in the data in Table 17.

Table 16

Perceived Ability for Students Equipped to Handle Technology

Question 9 – Do you believe that most students in today’s middle school classrooms are equipped to handle technology for educational purposes?			
Yes	No	Unsure	No Response
71 (68.9%)	9 (8.74%)	23 (22.3%)	2

Table 17

Frequency of Use of Technology

Questions 10 – Thinking about your use of technology as an instructional tool in the classroom rate yourself as to the frequency of technology use on a weekly basis.	
Frequency	# (Percent)
Less than once per week	11(10.8%)
Once per week	9(8.825)
Twice per week	18(17.6%)
Three times per week	22(21.6%)
Four times per week	11(10.8%)
Five times per week	31(30.4%)

Teachers and principals were next questioned concerning the value they place on technology in the classroom. The data clearly indicated that teachers find technology for instructional purposes either valuable or very valuable, which focuses on two research questions as found in the Purpose Statement:

- What perspectives do middle level teachers have about themselves with regard to the limitations they have concerning true technology integration in the classroom?

- What perspectives do middle level principals have about teachers in regard to the limitations they have concerning true technology integration in the classroom?

Table 18

Perceived Value of Technology

Question 11 – What value do you place on the use of technology as an instructional tool in the classroom?	
Value	# (Percent)
Very Valuable	40(38.8%)
Valuable	49(47.57%)
Moderately Valuable	7(6.8%)
Neither Valuable or Non-Valuable	7(6.85)
Not Valuable	0
No Response	2

In order to collect respondents' information for the qualitative portion of this study the next question asked teachers and principals if they would like to be interviewed concerning their perspectives on technology in the middle level classroom.

Table 19

Willingness to be Interviewed

Question 12 - If you checked Valuable or Very Valuable in question 11, would you be willing to be interviewed concerning your perspectives on technology in the middle school classrooms?			
Yes	No	Skipped Question	No Response
26	29	41	9

There was a large enough pool of respondents to randomly select interviewees from different District Factor Grouping categories to collect a variety of insights concerning technology. Of the 26 teachers and/or principals that responded with a “yes,” 8 were from GH districts, 14 from I districts, and 4 from J districts.

The next set of questions focused on two of the National Technology Standards. The questions were formulated from the national standards, using adapted wording from the standards as their basis, but were not identified as national technology standards on the survey. It was the intent of researcher to remove any mention of standards to avoid confusion concerning the questions and relationships to either national or state technology standards. Data from these questions indicates that there is a trend toward being able to incorporate technology tools in the classroom to increase learning. The data also indicated that educators were more comfortable developing experiences and assessments using technology. This also addresses two other research questions:

- What contributes to middle level teacher engagement in the use of technology to promote academic achievement?
- What perspectives do principals have that contribute to middle level teacher engagement in the use of technology to promote academic achievement?

Both sets of respondents indicated similarly in both questions that they could address the learning experiences that increase academic achievement.

Table 20

Ability to Design Lessons Using Technology

Question 14 - Are you able to design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary technology tools and resources to maximize content learning?		
Yes	No	Somewhat
45 (43.69%)	11 (10.68%)	47 (45.63%)

As teachers and principals gain confidence with fluency in technology systems, skills, and work processes, their perspectives on the use of technology in the classroom and its impact on academic achievement seems to indicate that more educators are recognizing the contribution it offers in the classroom (see Table 21).

Table 21

Ability to Exhibit Fluency in Technology

Question 15 - Are you able to exhibit fluency in technology systems, skills, and work processes that represent a teacher or principal in a global and digital society?		
Yes	No	Somewhat
43 (41.75%)	13 (12.62%)	47 (45.63%)

The next question was asked of principals only and focused on whether or not principals had a technology plan that focused on student achievement. Although more than half of principals did have a technology plan, the data also indicated a need for principals to develop plans that integrated technology into the classroom to effect student achievement. Evidently a few teachers must have completed this question since there

were only seven principal respondents in question 1 and in this question there were ten responses.

Table 22

Technology Plans to Promote Achievement

Question 16 - As a principal does, your perspective on technology include a comprehensive technology plan that integrates technology to promote student achievement and support organizational change?		
Yes	No	Somewhat
6 (60%)	3 (30%)	1 (10%)

Finally, a question was asked about the perspectives teachers and principals have concerning professional learning for themselves as it applies to technology, digital resources, and student achievement. A majority of educators indicated that they do have an environment in which teachers and principals feel that professional learning, innovation and student learning is established, which supports another research question. What contributes to middle level teacher engagement in the use of technology to promote academic success?

Table 23

Environment of Professional Learning for Technology

Question 17 - From your perspective does your school have an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources?			
Yes	No	Skipped Question	No Response
58 (56.31%)	5 (4.85%)	40 (38.83%)	2

The National Technology Standards were the only two standards imbedded in two questions using adaptive wording on the survey without any identification as being standards. Since teachers and principals were not told that these questions were related to the National Technology Standards, there may be some implication that educators are feeling comfortable with the design and development of technology tools and that they can use them to design, evaluate, and authenticate learning experiences that incorporate technology. To broaden the research, additional analysis was incorporated in this study to see if there was any relationship between the perspectives of teachers and principals and the National Technology Standards.

Further analysis was completed using SAS (Statistical Analysis System) software. The data analyzed was categorical data from the survey that included some missing responses for some of the questions. The researcher was looking for any association or statistical evidence of a relationship between pairs of variables. Since some of the expected responses were low, and the occurrence of low responses was high, the Fisher's Exact test was used to draw conclusions from the variables. The Fisher Exact test is used when sample sizes are small, and relies on exactness rather than approximation.

If the probability value from the report is less than .05, then the null hypothesis was rejected for independence and concludes that the two variables are related. On the other hand, failure to reject the null hypothesis indicates that there is insufficient evidence to reject the null hypothesis of independence between the two variables tested.

The following data indicates the areas of importance in which two variables were related:

Q20 (Years in Education) and Q9 (Belief in students to handle technology)

- Q20 (Years in Education) and Q14 (Ability to design learning experiences)
- Q02 (Years in Education) and Q15 (Demonstrating technology fluency)
- Q21 (Technology in high school) and Q14 (Ability to design learning experiences)
- Q21 (Technology in high school) and Q15 (Demonstrating technology fluency)
- Q23 (Technology Graduate Level) and Q08 (Identifying limitations)
- Q23 (Technology Graduate Level) and Q11 (Value placed on technology in education)
- Q23 (Technology Graduate Level) and Q15 (Demonstrating technology fluency)
- Q19 (Age range of respondent) and Q08 (Identifying limitations)
- Q19 (Age range of respondent) and Q14 (Ability to design learning experiences)
- Q19 (Age range of respondent) and Q15 (Demonstrating technology fluency)

Although implication is given to the relationship between the above variables, the two variables that have a larger impact are Q14 (Ability to design learning experiences) and Q15 (Demonstrating technology fluency). Data indicated that teachers and or principals who have more years in education, had technology in high school and graduate coursework, and were of a specific age perceived that they have the ability to exhibit fluency in technology systems, skills, and work processes that represent a teacher or principal in a global and digital society. These same data indicated that these educators perceive that they were able to design, develop, and evaluate authentic learning experiences and assessments incorporating contemporary technology tools and resources to maximize content learning. These two responses are directly related to the National Technology Standards and possibly support an increase in teachers' and principals'

abilities to use technology in learning experiences, and with fluency in middle level classrooms.

Summary

Through the use of the online survey, data were collected as described in this chapter. Throughout the survey responses, evidence indicated that teachers and principals have certain perspectives concerning the use of technology in middle level classrooms. Although many of the educators thought that access to equipment was inadequate, there was support for continued professional development and an openness to use technology in classroom learning experiences. In responding to questions concerning teachers' and principals' abilities to use technology to demonstrate, design, develop, and deliver lessons using these tools, 90 – 92% of educators either fully or somewhat aligned themselves with the National Technology Standards, and perceived their ability to meet these standards in their professional responsibilities. Principals also aligned themselves with the national standards, and the data supports that these administrative respondents felt comfortable with the use of technology, as well as believe that there is an environment of support for professional learning, which may include a plan for technology implementation in these middle level schools.

Chapter Five

Phase II: Interview Results

Introduction

In Chapter Three, the framework for determining the research methodology of this study was defined and delineated. This chapter describes the findings acquired through the data collected from selected middle level teachers and principals through the use of a personal interview.

Qualitative Design and Methods

The researcher collected email addresses given voluntarily in question 14 on the Internet survey by teachers and principals and emailed selected volunteers asking if they would like to participate in the face-to-face qualitative interview (Appendix G). A telephone call was then used to follow up with the interviewee to set up a date and time for the interview (Appendix F). The researcher held a 30 – 45 minute interview, using focused questions on technology use in the classroom, perspectives and limitations on technology, professional development, and requirements concerning technology (Appendix H). It was the intent of the researcher to determine whether data collected from the qualitative interviews would substantiate and give more insight into the data from the quantitative survey. In order to support or further explain the findings from the quantitative survey additional data was gathered from interviews using a systematic set of procedures to code all transcriptions (Reid, Gonzalez, Nordness, Trout, & Epstein, 2004).

Interview Themes

The researcher identified themes using the interview data by building a premise about why educators perceived technology the way they do in their middle level

classrooms, based on their interview responses. Six themes emerged: trainings, value, technology's role, limitations, ability to implement, and required use. This process was used to compare perceptions across three categories: Barriers, Beliefs, and Practices (Appendix I).

Teachers and Principals Interview Process

Each interview took place at a convenient location selected by the interviewee, which in all cases happened to be in the schools in which the teacher or principal was working. The settings included either a conference room, classroom, or the principal's office. The interviews were relaxed, but purposeful, and included 12 questions, 4 demographic and 8 focused on technology in the classroom. The questions selected were used to lead and center the interview on perspectives of technology in middle level classrooms (Appendix H).

Teachers and principals were presented with information concerning the study, the interview process, and an informed consent form, which was signed and returned to the researcher before the interview began.

Interview Findings

Each teacher and principal is described individually and then a discussion of the findings follows.

Teacher interviews.

Teacher interview 1: Ted. Ted currently teaches social studies in grade six and has been in the field of education for 30 years, with the last six years in his current position. He works in a suburban, upper middle class "I" district. Ted obtained a Master of Arts in Education. The interview was conducted in the teacher's classroom.

Perspectives. Ted's perspectives about technology are rooted in research, both based upon historical nature as well as current issues. He believes that "technology allows one to keep up to date, but that books are still relevant in today's classroom." Ted believes that technology is "important, it's not going away" and teachers are compelled to "get on board or be left behind." Ted sees technology as an "essential part" of his position in the managing of teacher tasks such as "lesson planning, research, attendance, and grading." He thinks that educators have a "misconception concerning student access" to technology because they are "unaware of the home circumstances."

Limitations. In his experience, Ted sees technology as being limited because students can spend "too much time researching, and not knowing not knowing what to look for, while they can find the topic easily in a book." Through his years of experience Ted indicates that "presumptions are made about accessibility and technology," as well as access to technology. He believes that "we can make assumptions that all students have access or that they can gain access in public places." Another area of concern is the time students spend on the Internet as opposed to a hardcopy of the material. He notes that, "students will spend significant time searching the Internet for an answer without even thinking about the use of hardcopy materials." For Ted this time factor becomes a limitation.

Implementation. In general, Ted sees the importance of technology as part of the way "things get done." From the simple things like grades to lesson plans, Ted sees the practices of technology "inherent in the fabric of the school." He realizes that it is not going away; therefore, both educators and students "must not only utilize it, but also buy into it." For students, he sees the connection between research and product development,

as well as keeping abreast of the current ideas, issues and problems of the day. Most importantly Ted uses technology to help students “draw conclusions from historical and current events as they occur,” but has yet to use it past simple video and research for lesson planning. Ted stated, “technology is the most positive thing to happen in education in recent years.”

Summary. Ted is a seasoned teacher who understands the importance of technology and recognizes that teachers need to keep current with the technology around them. He sees that students in today’s world are surrounded by these tools and have made choices to spend time using the tools. Ted believes that technology is a necessity and without knowing how to use it one will lack communication skills. He is also concerned about the “shift away from traditional methods of research where books are used as a resource.” He sees time as an obstacle for students because students are unaware of where to find information on the Internet. Lastly, Ted feels that although technology is everywhere it is important that both “students and teachers should not lose sight of the use of books and hard-copied materials.” His perspective was a mandate that “books have a valid role, and we need to make sure kids remember that and that we remember it ourselves.”

Teacher Interview 2: Laura. Laura is currently assigned as a special education teacher focusing on language arts, and in-class support in grades six, seven, and eight. She has been teaching for seven years in both private and public schools. Laura holds a Master of Education degree with an emphasis in Special Education and is working in a suburban, middle class “GH” district. The interview was conducted in a conference room in the middle school.

Perspectives. Laura sees technology integrated at “several levels of the educational process” and not necessarily as a “standalone component in education.” She understands that technology “flows between the school and home environments,” and that access continues for the students. From Laura’s perspective, child development is different then in the past, with “the brain being wired differently, and the air being digital.” She sees digital tools necessary with emphasis upon students not to “turn off these tools when entering the school environment.” Laura’s beliefs about technology in education are deeply connected to her ability to reflect on how she herself can improve and make lessons better.

Limitations. For Laura comfort with technology is key to success. She sees the traditional role of the teacher as “a limitation in itself, and that control can get in the way of technology.” Obstacles for this teacher are related to her own inability to research what she needs, and does not see the obstacle as someone else’s issue. She does see that both the “lack of collaboration and modeling might decrease implementation of technology.” From Laura’s perspective she thinks, “teachers might infuse technology more if it was modeled,” thus making the comfort level of the teacher higher and decreasing the limitation. Laura sees the lack of equipment in schools as “a detriment to the entire digital revolution.”

Implementation. Laura sees technology as a way of thinking and experiencing education. Students in her classes often have initial experiences in the classes that incorporate “warm-up activities using technology,” and Laura uses technology resources to engage students’ senses. This teacher thinks carefully about the way she designs her lessons so that students have a “varied approach to using tools that allow them to

organize and present material.” Laura’s students’ access to technology tools is designed around organizational structures so that students can easily find the resources they need to support his or her learning. In her classes, Laura incorporates pulse pens that record information and then help students find the information in their notebooks, iPads, glogs, Wikis, auditory tools, and animation to help students make connections to the expected learning outcomes. She says “They have to be able to understand about creating, that would be the next step. For example, how they can create animation to do a presentation as opposed to a flat PowerPoint.” Laura feels that putting the tools in the hands of the students helps them to find out what works for them and supports them in their learning and “engages them to help make connections.”

Summary. Laura sees technology as an integral part of the learning process, and a connection to the great global perspective. She is cognizant of designing lessons that use “several senses and purposely uses technology to reach students at different levels of the learning process.” Laura believes that technology is vital to the classroom, and that students “breathe in a digital world.” On a scale of one to five, Laura believes that she is a three because she is always striving to be better at what she sets out to do. Her ultimate goal would be to design lessons incorporating technology in which she could “let control go fully to the students.” Laura feels that reflection, collaboration, and the pooling of information will help all teachers to infuse technology into their classrooms more frequently. Laura challenges fellow educators to talk and share with each other on topics such as “I did a lesson on this today, guess what I used,” or, “This was effective,” or, “Do you have an idea about how I can infuse Technology in social studies?” “Oh, I used that in science.”

Teacher Interview 3: Brian. Brian is currently teaching English Language Arts in seventh grade. Brian is completing his seventh year in middle level education and has also taught special education, as well as coached basketball and baseball at his middle school. Brian holds a BA in special education with a concentration in history, and certifications in middle school math and English. He is currently working in an upper middle class “I” district. The interview was conducted in the teacher’s classroom.

Perspectives. Brian believes that technology must be transparent and that schools must realize that this is “not something coming, but that it is upon us.” He is concerned with the cost of technology and the ability for school districts to maintain “reliable and substantive equipment,” but maintains that it is now a responsibility of school districts to make it a part of the learning process, not an add on. Brian perceives that when students make connections to the outside world, beyond school, it “makes the learning deeper and richer.” He believes that when students are working in an environment that uses technology that “there are higher levels of engagement, that knowledge is shared more easily, and that students seem to retain information from the experiences they have with the technology.”

Limitations. Brian felt that any limitations concerning technology use in the classroom were self-imposed. He mentioned that with the use of technology came a “fear of moving out of your comfort zone.” Brian acknowledges that he likes control, but that he is aware that loss of control is not a “bad thing, but freeing.” He is aware that his fear of not knowing the outcome may hinder implementation, but is willing to take a chance to see if students are more engaged and deepening their knowledge. Brian wishes that he had more “time to experiment” and said, “I can’t get the equipment as much as I need it.”

Implementation. Brian shared that he decided to start the year off with technology by gathering information about the interests of students through the use of a survey. By using the information from the survey Brian said he was “able to tailor activities in the classroom that touched on the interests of the students he was teaching.” Through a professional development seminar at his school during the summer he was able to learn about Moodle, an online course creation program. Brian designed interactive homework assignments, which he listed as: “reading assignments, writing assignments, comments sections on other students’ work, and online assessments.” The teacher feels that because he was given the opportunity to learn about the Moodle program and begin the creation of an online class that it was easier to implement this type of technology directly into the classroom. Brian does not look at technology as an add-on, but “just as part of the way the classroom runs.”

Summary. Brian is a teacher who embraces opportunities to incorporate technology into the everyday running of his classroom. He looks for situations where instruction can be enhanced through the use of technology and avails himself to professional development that will support the learning activities he has chosen for the students to experience. Brian understands that the limitations he places on himself are natural and that by trial and error he can improve his teaching as well as student learning. Brian believes that professional development in technology avails teachers with opportunities to create new and engaging lessons for the students they teach. Brian rated himself as a four on a scale of one to five as far as his implementation and use of technology was concerned. He felt that “there was always room for improvement.”

Teacher Interview 4: Maria. Maria is currently in a middle school science classroom, teaching grades six, seven, and eight. She is working in a “GH” school district. Maria will complete her studies for a Master’s degree in Science Education in May 2013. The interview was conducted in the school science lab.

Perspectives. Maria felt that technology is important in the academic setting and it allows students to interact with their learning environment. She feels that one of the biggest worries regarding technology is the “financial piece.” She indicated that “most kids have access,” but she wasn’t sure if there was equality in home and school access. Maria also felt in today’s society technology is “very important,” therefore students need to know how to use it. She believes that “the more they use it, the more they experiment with it, the better they will handle the world in which they live.” Maria identified the importance of using technology as part of her own practices through lesson planning, using the active board, and communicating with parents and other professionals.

Limitations. Maria’s biggest barrier to using technology in the classroom setting is having access to equipment. She felt that the lack of access might be associated with financial barriers. She said, “I’m not sure how administration make priorities, but technology needs to be pretty high on the scale.” Maria felt that the more access they had to technology the more often students would be able to master the technology and not let it get in the way of learning. She felt that without continual use of technology, the students “may not learn how to use it properly, and this would become an obstruction to the world in which they are living.” Maria indicated that, “unless teachers are being trained consistently on technology they would fall behind the students.” She discussed

how important it was for students to learn how to use technology because “our world is constantly changing and they need to be able to keep up with it.”

Implementation. Maria commented on the importance technology plays in the world today. She recognized different types of technology that she currently uses in her classroom setting such as “laptops, document camera, USB microscopes, programs such as Gizmos, and other science equipment that supports experiments.” Maria uses some type of technology on a daily basis in the classroom setting with students. She reminded me that, “a thermometer is a form of technology, and so is a scale.” Maria said, “We use technology to teach the students and aid in our instruction with them.” She also acknowledged that it was important for teachers to stay up on technology so that they could incorporate it into the classroom setting. She detailed two different types of training that she has received. The first was the use of online curriculum for planning and instruction purposes. The second was intensive instruction in the use of the Smart Board. Maria felt that “professional development is key to successful use of technology in the classroom.”

Summary. Maria’s concerns were primarily with access to technology and the financial concerns related to gaining more access. She values the use of the technology and sees it as something that is necessary for both students and teachers. Maria feels that teachers need to “know how to use technology in order to teach students how to use it.” She also felt it was very important to have students use technology because “the world is changing and we live in a society where technology has become something we use daily.” Maria commented on the use of the on-line curriculum to help with both

classroom and individual instruction. Maria rated herself as a four on a scale of one to five as far as the implementation and use of technology was concerned.

Teacher Interview 5: Ken. Ken is currently a middle school English Language Arts teacher in a “J” district. He teaches students in grade seven. Ken has been teaching for eight years and is currently working on a Masters in Writing. Ken has been in this position for five of the eight years of his teaching career. The interview was conducted in Ken’s classroom after school.

Perspectives. Ken believes that technology is a highly valuable tool for the classroom. He commented, “Technology is a very valuable tool for the classroom. If we didn’t have access to different types of technology we wouldn’t reach as many students. Our students learn through various modalities so technology only allows us to meet the learning needs of more students.” He felt that teachers can use technology in a multitude of different ways, including “Internet searching, PowerPoint, spreadsheets, video, and music.” Ken also mentioned that he used it for lesson planning, email, and other functional uses as a teacher. For students, Ken felt that technology provided an opportunity for all students to learn. He strongly believes that all teachers must have a perspective that “all students can learn.” Ken felt it was his responsibility to use technology to assist in the students’ learning process. He also thought that it provided students with different ways to access and present information.

Limitations. Two areas of concern came forth during Ken’s interview access to materials and training. Ken communicated that he felt one of the more significant limitations to technology use in the classroom was “continual access to equipment.” “We want to use the equipment, but you have to sign it out and share with other teachers.” He

indicated that it's "difficult to start a project and sustain it if the equipment is not available." He also mentioned that teachers have a responsibility to teach students that there are limitations to technology and that "the human brain is a powerful computer." Ken also commented on how having training on the use of technology also plays an important role in allowing educators to implement technology on a more frequent basis. He shared that there was not enough consistent professional development offered throughout the year. He mentioned that because he learns on his own, but many teachers really need the support to institute any change in the classroom. Ken commented on the environment playing an "important role in the use of technology and if there isn't support from the administration that other limitations could be imposed on the classroom environment even though the teacher wanted to use technology."

Implementation. Ken commented on how important the use of technology is in today's society because of the myriad of changes that has occurred in the last 20 years. His implementation focuses on activities that are "student-centered," and "creative." He discussed his current use of technology in the academic setting and how he uses these on a daily basis. In order to keep himself focused, Ken has partnered with another teacher that supports his ideas concerning technology. They have developed their own professional learning committee, and they work together after school, and sometimes at night to create and solve problems. Laughingly he said, "Sometimes I hear my colleagues voice before I fall asleep and not my wife." As far as for his own use, "it's a tool that is indispensable." He indicated that he used it for communication, creation, and analyzing data for student achievement.

Summary. Ken believed that technology is an essential part of the school environment and student learning. However, Ken acknowledged that access to technology, professional development, and environmental factors may serve to limit implementation. He mentioned the many ways in which technology plays a function in his daily responsibilities, which at times meant preparing and planning well beyond the school day. Ken rated himself as a four on a scale of one to five as far as the implementation and use of technology was concerned.

Teacher Interview 6: Ann. Ann is currently a middle school art teacher in a “GH” district. She teaches students in grades seven and eight. Ann has been teaching for seven years, not including four years previously before taking leave to raise her family. Ann holds a Masters in Art Education. She has been in this position for seven years of her teaching career. The interview was conducted in the school conference room after school.

Perspectives. Ann thinks the students would like to use technology all the time. She said, “When I bring Netbooks in, Holy Mackerel, they love taking the iPad and playing.” Ann believes that as educators we have to figure out things to channel those energies in the right directions. As an art teacher Ann sees students in today’s classrooms as students who want “independency, along with immediate gratification.” She said, “they want that opportunity to be that thing that is larger than life.” She indicated that students sense more possibilities using technology, and aren’t afraid to fail because they know they can try again. Ann sees the value in technology because the technology that she uses allows students to explore the creative aspects of them, and express who they are as young adolescents.

Limitations. As the number one stumbling block Ann sees “time” as her limitation. Time to learn more advanced technologies herself, and time for students to learn as well. Because Ann teaches classes in cycles and only sees the students for a limited amount of time each year, her time is precious. At the same time she knows she will see her students the following year and can continue with using technology with them in her discipline. She also feels as though she just learned one more thing, saying “like Genesis for grading, and after you’ve learned it, it’s already old.” Ann also noted that access to equipment limits the time anyone can have with technology. In her school computers and iPads must be scheduled for use, and they are not always available.

Implementation. Regarding implementation Ann made a statement that caused one to pause and think about why she believes in the use of technology.

You see the light in their eyes. You are speaking their language. I have seen results. It is the look and lightening I observed in a class the other day. I saw the students using the clicker and I asked the student for help. It now changes the game you are talking their language. It allows for immediate affirmation. It is like, when you go to a different country, and you speak a little of the language, people will embrace you. I believe it is the same thing with kids in classes, with the teacher who embraces it a little bit, I think the kids will go with him. They will take it to the next level.

For Ann implementation went beyond her classroom of digital painting, photos, and animation. She noted how technology has helped her with planning, grading, and keeping connected to her family near and far. By her implementing it in the classroom she also felt more comfortable implementing it personally, which she believes allows her to go to the next step.

Summary. Ann feels that students want to be connected through technology, and that technology speaks to them. She also believes that if teachers learned the language of technology they might be able to engage students more in the learning process. She

believes that students want independence in their learning and that technology allows for that. She feels that time hinders exploration and learning for both herself and the students. Ann sees the excitement in students when using technology and feels that “speaking their language is essential to making connections with students in today’s classrooms.” Ann rated herself as a four on a scale of one to five as far as the implementation and use of technology was concerned.

Principal interviews.

Principal Interview 1: Raymond. Raymond is currently a middle school principal for a “GH” district. He has a Masters degree in Educational Administration. Raymond has been a principal for five years, after spending ten years as a classroom teacher in another school district. The interview was conducted in a conference room of the middle school.

Perspectives. In general, Raymond felt that “technology is valuable,” but had concerns that technology be “used efficiently.” Raymond believes that teachers should research specifics about the use of technology and what and how it should be used in the classroom. He felt that “he had the ability to design good lesson” and “bring them into the classroom more easily.” His hesitation came in the “inappropriate use of technology in the classroom and the possible lack of accountability for the use of technology in the classroom.” As far as students are concerned, Raymond felt that technology would “probably have a high impact on students due to the interactive nature and ability to communicate beyond the classroom walls.” Raymond also felt that students needed to have skills that would be necessary for “jobs that are not even created at this time.” He felt that teachers did not understand technology’s “impact on the classroom and learning”

and that it was his responsibility to make sure programs, equipment and professional development were in place.

Limitations. The theme of training and accountability rose to a level of importance in Raymond's interview. Raymond indicated that, "proper training and implementation were obstacles to integrating technology in the classroom." The lack of specific technology and use came out as a concern for him. Raymond was able to identify that he received and was aware of training on newer technologies, specifically in video streaming and the use of the tablet technology. Although not required by the district, Raymond thought that this was a wasted technology, and that staff should be "held accountable for implementation of technology," and be given a time frame to complete the expectation. He also felt that "staff needed more time to learn the technology" and needed "specific guidelines" on implementation in order to avoid failure and lack of use.

Implementation. Generally, Raymond has a positive outlook on the use of technology in middle schools, but kept coming back to the themes efficiency, appropriate use, and accountability on the part of the teachers. As for students Raymond is supportive of the importance of technology and its use in the classroom. He also indicates that "discussion is important between himself and his teachers to consider technologies for the specific needs of students." It was important for Raymond to see connections between "research, implementation, and accountability" on the part of teachers using technology. Raymond sees practices directly related to expectations of teachers and saw administrators working with teachers on growth plans and commented, "so that accountability was there as well."

Summary. Raymond's concerns centered on proper training, appropriateness, and accountability. Raymond sees the need for technology in the classroom and believes that it will be a pronounced element in future classes because the jobs that are not even created will need greater technology skill. Finally, Raymond was firm in believing that accountability for implementing technology in the classroom needs to be established for technology practices to occur. Raymond reported that on a scale of one to five with implementation of technology that he was "unfortunately" a two.

Principal Interview 2: Paul. Paul is currently a principal of an "I" district. Included with his middle school duties, Paul currently supervises the technology teachers and technical support staff district-wide. He has a Masters degree in Curriculum and Instruction, as well as Administration, and has been in education for 25 years, five as a principal. The interview was conducted in his office.

Perspectives. Paul is a strong advocate for technology, with a belief that he has staked his professional reputation on the use of educational technology. He thinks that a teacher's use of technology is closely connected to the teacher's personal belief system in terms of the value of technology, and that "teachers who use it on a personal level will find ways to use it with students." He does see connections also with accessibility and use, as well as "technology not always being the easier way to accomplish a task in classroom." Paul sees deep associations between personal and professional use of technology to transform education and to advance students' academic performance. He views technology as a "vehicle that will get students to where they need to go in school and the world." Paul acknowledges that it is difficult for teachers to keep up with the changing technologies.

Limitations. While training was mentioned, Paul's focus on prevention of use of technology centered on access, speed of tasks accomplished, and changes. Paul believes that "if teachers had consistent access to technology tools such as laptops or iPads in the classroom that the teacher would choose to use the laptops or iPads more frequently" because the teacher has access to the equipment. In addition he sees that it's difficult and tiring to constantly change and modify the work you are doing on a regular basis. "We need to adapt a program and stay with it for a little while. If we don't time becomes our enemy." Lastly, Paul thought that creating activities using technology is time consuming, and it becomes an obstacle for people in education. He linked change as a limitation because he viewed teachers as believing that "it's tiring to continually change and modify everything you do on a daily basis."

Implementation. Paul sees technology as a transformative partner in education. He thinks that the "fix" to education can be found in the use of technology, and that "it's a way to obtain positive outcomes for current educational matters." He communicated that technology should be used with students to create collaboration, to help them to problem-solve, and to produce an outcome with partners and experts in a field using the content and information that they have at hand. Paul sees communication through the use of technology as a "rich source of information and that technology is transformational." In addition Paul stated that technology can be "multi-modal; tactile, visual, text-based," and can add to the cadre of skills used in differentiation.

Summary. Paul believes that "technology is an important part of the solution to transforming educational issues, and ultimately student outcomes." Paul also states that "technology is the underlying vehicle to get education to where it needs to go," but

understands that access, availability, and belief systems of educators are a vital link to the “propulsion of technology” in education. Paul’s perception of himself although having a facility with technology is that he is at a three or four range out of a five because there is always something to learn, and that he has difficulty rating himself.

Principal Interview 3: Nancy. Nancy is currently a principal in an “I” district and has been a principal for four years. Nancy mentioned that she was a vice-principal for two years and before that a math teacher. She holds a Master of Arts in Educational Administration. The interview was conducted in her office.

Perspectives. Nancy sees technology as “an equalizer.” She cites that with the use of technology teachers, students, parents, and administration can “collaborate together for the benefit of students.” She also believes that “technology has opened the doors to students who would have never thought of being part of a specific class” and after exposure to the subject through technology have chosen to elect the class. Nancy stated, “When we had a robotics club here, there were times that it was all boys or we had one girl, that’s it. Now our female population in the robotics class has skyrocketed as a result of us doing this in class, so they are seeing how math and robotics, engineering and technology can really be fun. So I give the robotics program (technology) credit for that.” Nancy believes that technology allows students greater participation in the learning process by giving them access to research, exploration, and communication. She also sees it as a way in which teachers can assess students’ growth through various methods, and not just a paper and pencil assessment.

Limitations. Nancy’s first comment was, “Well, money.” She admitted that the district had no comprehensive plan for technology, nor did the school. Her major source

of funding for individual or school initiatives comes from an educational foundation created to support public education. Nancy feels that “one of the main reasons technology is not used even more is because of a lack of professional development time.” She mentioned that there were many competing factors for teachers’ time, which included “training on the Common Core Standards, a new teacher evaluation system, and other requirements coming down from the state that eat up time to improve on classroom instruction and techniques.” Nancy closed with a comment saying, “It’s actually access and time. Time for PD, equipment.”

Implementation. Nancy indicated that she rearranged the schedule so that students are meeting for 60 minutes each day for core subjects. By doing this she believes she has created time for teachers to feel that they can use the technology in the classroom. Without time Nancy feels that the pressure of getting the curriculum completed may work against trying new or innovative ideas. She was happy to say that her teachers are “not resistant to using technology in their classrooms or for professional work.” Nancy sees that teachers are trying to implement ideas because at faculty meetings different teachers present ideas that can be used quickly and don’t consume too much time. Recently a teacher introduced Prezi, a presentation tool. Through this exposure she was able to learn a new skill and use it at a future faculty meeting. As far as her implementation, Nancy uses technology for communication, evaluation process, presentations, and budgeting. Nancy is always looking for ways to improve herself and model good practices to the faculty and students.

Summary. Nancy is a principal of a middle school where there is no comprehensive plan for technology, but yet innovation and trial activities are explored

with the resources that she gets from funding outside the school district. She believes that technology exposes students to areas that they would not be normally exposed to and can help students find their interests. Since professional development time is scarce, Nancy has allowed teachers to promote their ideas and skills at faculty meetings. Nancy is looking for ways to allow technology to be present by allowing exploration and exposure to the technologies. Nancy rated herself as a three on a scale of one to five as far as the implementation and use of technology was concerned.

Principal Interview 4: Shawn. Shawn is currently a principal in a middle school in a “GH” district. Prior to his job as a principal, Shawn was a teacher for four years at the high school level. Shawn had obtained his Master’s degree in Administration plus 30 credits. The interview was conducted in the principal’s conference room of the middle school.

Perspectives. Overall, Shawn felt that technology is very important in the academic setting, and sees technology as being like “the back of my hand.” Shawn perceives that technology is ubiquitous and that it is becoming a natural part of the running of the school. Shawn feels that technology is a necessity as the world is constantly changing, so having continual training is necessary. In regards to students, he thinks that “all students should have access to technology” and is concerned that this is not happening in the academic environment. He also believes that “technology should be used to assist students with hands-on learning” and make academics “more inclusive” for students. Shawn also commented on the importance of knowing how to use technology, and understands it will be valuable as students get out of school due to the constant changes, which are happening in the world of technology. He looks at technology as a

supply that parents should be willing to provide. He said, “I understand everyone’s issues with finances. If there was something you know was critical, to your child’s education, for the betterment of your child, you would do what it takes to happen.” He believes that we as a society are in transition and that we need to set priorities in education, which include technological access.

Limitations. A definite theme emerged among Shawn’s responses to the interview question on limitations. He sees that change is a limiting factor and that he must be careful not to be a “rah, rah” person for technology without acknowledging the learning process. Shawn believes that we need to move away from a philosophy that states, “If something isn’t broken, don’t fix it.” He sees this type of thinking as limiting and responding to relevance. In fact he mentioned that he thought it might even take schools backward if not challenged. These were the only limitations he could express.

Implementation. Overall, Shawn identified the use of technology as a benefit to students and teachers. Shawn communicated that it serves as a valuable tool for differentiating instruction and providing hand-on learning to students. He communicates with his teachers through “email, Twitter, and Face Book.” Additionally, Shawn stated that “students need to know how to use different types of technology so that they can adapt to the ever-changing world around them.” Shawn also identified that he conducts professional development via the use of technology for other educators. He has educated the district on the importance of putting technology into the hands of the teacher and is moving toward a one-to-one iPad for each teacher. Shawn felt that “the use of technology is a necessity because if you don’t know how to use it you will be left behind in so many ways in today’s society.” He stated, “It’s not coming, it’s upon us.”

Summary. Shawn values the use of the technology and sees it as something that is necessary for both students and teachers. Shawn communicated how the world is changing and in order to keep up and not get lost students and teachers need to be trained in the use of technology and use it frequently. He sees technology as ubiquitous and a natural way of learning and running a school. He feels that he is only limited by the philosophy that some people have concerning change. Finally, Shawn felt technology is an important tool for education as it provides opportunities for all educators and students to explore and be part of the world around them. Shawn reported that on a scale of one to five he was a four or five depending on the day.

Summary of teacher and principal interviews. This summary describes the three themes found in the interviews of teachers and principals concerning the use of technology in the middle level classroom. Three primary themes arose among this group of participants: (a) beliefs, (b) barriers, and (c) practices. Similar to Palak and Walls (2009) all of the participants identified in some respect how the implementation of technology in the academic setting is a critical part of student learning in today's middle level schools. These themes are closely related to the technology circumstances, which respondent teachers and principals are currently experiencing in their middle level schools' environments. Both principals and teachers recognized how using technology impacts and potentially enhances student learning in the academic setting. The two groups of participants, principals and teachers, had strong perspectives about technology in the middle level classroom and included words such as: important, essential, integrated, transparent, connected, collaborative, valuable, and creative. Second, training was identified as a vital component to the implementation of technology in the academic

setting. This group of participants identified a clear need for additional training in order to assist educators in feeling comfortable with using technology in the classroom. Third, each of the interviewees was able to identify various ways in which they implemented technology within the scope of their professional responsibilities. Principals identified technology use for observations, communication, and professional development, while teachers indicated technology use for engaging students in the learning process, grading, and planning.

In addition, this group of participants indicated similar reasons for the use of technology found by Palak and Walls (2009), which consisted of engagement of students, independent student learning, and communications as part of the theme on practices. As far as limitations were concerned both groups identified that the lack of access to equipment for both teachers and students can prohibit educators from fully incorporating technology into lessons plans, or with activities for students. The group indicated that funding technology programs is difficult, and sustained professional development is needed to engage teachers and keep them abreast of current technological programs, methods, and activities.

There was an overall agreement that with society in continual flux there is a need to educate students about the use of technology in order to help promote communication skills and prepare students for life in this ever-changing society. Overall, technology is being used by educators, to what level is still unclear. Rosen and Weil (1995) indicated that some teachers were not using technology because of fear of using the technology itself. In this study both teachers and principals acknowledged the need for further sustained professional development and that professional development with a focus on

the integration of technology for student-centered practices might possibly have a positive effect on shifting beliefs and implementation.

Throughout the conversations with teachers the underling message reveals that teachers are comfortable with the requirements of national technology standards in that they were developing, designing, and evaluating learning experiences, which included contemporary tools and resources for students. During the interviews teachers continually alluded to the need for students to become digital citizens and be part of the ever-changing world in which they were living. Presumptively these teachers placed the same expectations on themselves by trying to incorporate current tools for learning and through using technology as part of their professional responsibilities. These communications concerning perspectives and implementation speak directly to the two national technology standards embedded in the survey and interview discussions. Standard Two focuses on teachers that “design and develop digital age learning experiences and assessments” and standard three asks teachers to “model digital age work and learning” (ISTE, 2011).

For principals the conversation was more specific when addressing technology in the classroom then it was with implementing technology at the administrative level. Although principals indicated that they used technology primarily for communication and professional development, few principals addressed using technology to support a shared school vision, to help sustain a culture for learning, or to address school improvement. These topics are directly related to the national standards for administrators as found in the standard on Visionary Leadership, Digital Age Learning Culture, and Systemic Improvement (ISTE, 2011). From the interviews most principals spoke in general terms

concerning the use of technology, with little or no plan on how to integrate technological concepts and skills through professional development, classroom activities, or sustained improvement. Principals did address the importance of being digitally literate and promoted professional development opportunities for teachers through the use of technology, which address national standard three, Excellence in Professional Practice (ISTE, 2011).

Interview summary. Through the use of personal interviews, the data were collected as described in this chapter. Emerging from the interview data were themes related to how teachers and principals perceived the use of technology for teaching and learning, what caused limitations for the use of technology, and how teachers and principals implemented technology in the middle level classroom. A continual mantra emerged that teachers and principals saw technology as valuable, that they would use more technology if there was access to the equipment, and that sustained professional development is necessary to support all educators when using technology.

Chapter Six will capsule the study's purpose, methods, results, and conclusions. In this chapter you will also find suggestions for further research and final thoughts concerning the study.

Chapter Six

Discussion and Conclusion

This chapter provides an overview of the study's focus and methodology, along with a discussion of the findings and a conclusion. Proposed future research recommendations and a finale are found at the end of the chapter.

This study addressed the question concerning middle school teacher and principal perspectives on the use of technologies in their school and classroom settings. Specifically, the study looked at middle level teachers' and principals' perspectives, limitations, and engagement concerning the use of technology in the educational environment of middle school students in Morris County, New Jersey.

The study was carried out in two phases. The first phase included an online survey of 25 questions, which was completed by 105 respondents from middle level schools containing grades six, seven, and eight. Using a voluntary response field in question 14, teachers and principals could elect to be interviewed for the second phase of the study. The second phase of the study gathered qualitative data through the use of interviews from six middle level teachers and four principals from a variety of district factor groupings; focusing on perspectives, limitations, and implementation of technology in middle level classrooms. The purpose of completing a mixed method study was to further explain the finds found in the quantitative phase of the study, and to support any relationship to technology standards as mentioned in Chapter One.

Discussion

Designed to push our nation toward a higher level than the average, the National Technology Standards have been inculcated into the beliefs and practices of many of the

teachers and principals in middle schools in Morris County, New Jersey. Through data from the Internet survey and the personal interviews there is a noticeable indication that teachers and principals in middle level education have embraced technology as part of the culture of teaching, learning, and completing professional responsibilities. Although only three of the National Technology Standards were the focus for teachers, and only two for principals, the data signal that teachers and principals are actively engaged within the context of the additional standards in their professional assignments. Teachers spoke about their abilities to facilitate and use technology to reach and inspire students (Teacher Standard 1), that they were comfortable with designing and developing digital learning experiences (Teacher Standard 2), and most could model a variety of levels of digital expertise (Teacher Standard 3). Even though not mentioned directly there was an indication that teachers and principals believed that students needed to be part of the digital society, in itself then adhering to digital citizenship and responsibility (Teacher Standard 4). Lastly, teachers and principals hungered for appropriate and sustained professional development (Teacher Standard 5). Principals also spoke to many of the administrator technology standards, and supported teacher practices through the use of technology. One of the principal interviewees had a vision of technology for the school community (Administrator Standard 1). All principals spoke to the importance of being a digital learner that uses technology to gain the best educational outcome (Administrator Standard 2). Principals mentioned that professional development and having a school that supported learning with technology was important to progress and growth (Administrator Standard 3). Although indicated in Phase 1 of the online survey, no principal spoke to the need to have a systemic improvement plan for incorporating technology into the school

community (Administrator Standard 4). Finally, principals did see the need to reference digital citizenship, but had no in-depth thought concerning the topic (Administrator Standard 5). With teachers and principals having access to a variety of equipment, such as desktop and laptop computers, interactive whiteboards, tablets, and smart phones, middle level educators seem not as reluctant to try to use technology as part of the classroom-learning environment. The respondents also indicated that as educators they have access to ancillary technology equipment such as, CD/DVD burners, digital camera, document cameras, scanners, video cameras, and access to the Internet. Overwhelmingly, teachers and principals have the opportunity to attend periodic professional development focusing on technology or technology integration. Technology is ever changing, and it appears that districts in Morris County, New Jersey are offering limited continual professional development to support educators with the transition to a digital classroom. These professional development opportunities are important for keeping teachers and principals abreast of the updated and contemporary uses of technology to actively engage students in the learning process. With a majority of teachers and principals indicating that they use technology at least three times per week in the classroom as an instructional tool, we again see that educators are transitioning to more frequent use of technology on an ongoing basis. This transition to a greater frequency of technology use may be related to the middle school teachers and principals perceiving technology as a valuable or very valuable instructional tool in the classroom. With value added perspectives educators need to have the support that underpins the transition process to a digital classroom.

Supporting what Rogers (2000) indicated concerning limitations on the use of technology in the classroom, teachers and principals in this study were able to identify

the number one issue preventing technology integration, which is the lack of equipment for instructional purposes. If this is the case then we are seeing a transformation of the mindset of teachers and principals to a willingness to incorporate technology in middle level classrooms for instructional purposes, but they do not always have the resources to accomplish their goals. This transition is supported by the preponderance of respondents indicating that they feel that they are somewhat or ready to design, develop, and evaluate learning experiences using technology and that they themselves feel that they can exhibit the skills that represent a teacher or principal in a digital society. Additionally teachers and principals believed that they work in educational communities that support professional learning and innovation through the infusion of contemporary technologies and digital resources.

If teachers and principals are ready, willing, and able to incorporate technology into middle level classroom learning experiences then the question must be asked concerning appropriately funding technology. Districts have spent large amounts of funds on equipment for middle schools, but are there enough updated equipment to meet the needs of every classroom? That question is beyond the scope of this study, but it seems natural that if teachers and principals view themselves as ready to incorporate technology then districts should provide the means by which they can accomplish the requirements set before them. Possibly districts may need to prioritize budgeting and use decision-making processes that enable more teachers to participate in the use of technology as an instructional tool in middle level classrooms, or allow students to use personal equipment within the middle school environment.

Current Developments in Technology Use in Schools

As districts purchase technology equipment for teacher and student use, educators are already looking at a life expectancy for the equipment. As with many technologies, equipment advances occur frequently and districts are unable to keep up with annual replacement equipment. With soaring school budgets and decreased state support for public schools in New Jersey, districts may need to look at alternatives to providing 100% of the technology equipment for use in schools. If teachers indicate that they are ready to use technology in their classrooms, and we understand that technology enhances teaching and learning, why are we moving so slowly at making the technology available to the educational community?

An ingredient of the problem lies with understanding how to manage personal equipment and responsibilities when students are using their equipment on school grounds. At one time control and access to the Internet and other virtual sites was difficult for school districts to manage, but with today's security systems and enhanced entrance controls, schools can have a better handle on access by programming their internal technology wireless systems. Schools districts are beginning to establish Bring Your Own Device (BYOD) programs in New Jersey to help teachers and students meet the demands for technology-enriched classroom teaching and learning. But before districts begin this process, Rath (2012) indicates that it is important to examine four areas of focus: capacity verses coverage, directory services and device registration, role-based access, and filtering. Districts may also need to examine their technology user policies in order to provide guidance to school officials when dealing with security breaches, and other issues that arise from a BYOD program.

The data collected in this study indicate that teachers are poised to make inroads on the use of technology in middle level classrooms. However, they are stymied by the lack of equipment and continual professional development needed to sustain and engage students in the learning process. From a leadership perspective our obligation to find ways for teachers to engage students in technology-enriched learning experiences in middle level education may also stem from a lack of systemic planning in the area of technology on the part of the school. As indicated in the survey 40% of principal respondents said that they either had no plan or that there was somewhat of a plan to integrate technology in middle level schools. No principal spoke of planning for technology during the interviews or mentioned a systemic way of incorporating technology in middle level classrooms.

Planning for Technology Improvements to Facilitate Teacher and Student Engagement

Since teachers and principals indicated that they are prepared to include technology in their middle level classrooms and schools, a possible solution for supporting the educational community may fall in the development of a long term technology plan that is developed by all stakeholders that are affected by the plan. This type of technology plan is clearly connected to the charge from the National Technology Standards for Administrators. Standard Four: Systemic Improvement. Educational Administrators provide digital age leadership and management to continuously improve the organization through the effective use of information and technology resources (ISTE, 2011). From the Internet survey and the personal interviews, one of the missing elements that directly connects with Standard Four and underpins successful programs in

schools is a long-term technology plan. Through the use of information gathered in doctoral studies and courses taken at UNL, such as School Improvement Process and School Improvement Planning, the researcher suggests the following developmental process be placed into consideration when considering a long-term technology plan:

1. First, take inventory of the present usable equipment and human resources, which should include, classroom equipment, general use equipment, networking equipment and capability, Internet and telecommunication provider capacity, filtering methods and programs, currently used software programs, as well as administrative and support staff directly assigned to the area of technology.
2. Create a needs assessment that is administered to the educational community at large. This needs assessment should take into consideration: students, parents, teachers, and administrators perspectives on current use of technology, what they believe is needed in the future, and what they are willing to support (Bernhardt, 2004). The results of the assessment should help with the creation of goals and strategies that propel the long-term technology plan.
3. Create specific and clear goals that address both physical and academic needs of the district. The goals might include, equipment, cables, electrical systems or support, networking, bandwidth, curricular outcomes for specific content areas, and any requirements as established by the federal or state agencies in the area of technology.

4. Develop realistic goals and strategies for technology implementation, which focus on academic achievement (Bernhardt, 2004). Include in these goals and strategies, specifics, measurable outcomes, attainable possibilities, the person or persons responsible for actions, and make the goals time-bound.
5. Advance a professional development strategy that ensures that teachers, support staff, and administrators are incorporated in professional development activities. The school should also consider offering parental workshops to help parents understand the goals, objectives, and activities that students are experiencing through middle level classroom activities.
6. Be prepared for mid-plan developments, opportunities, and issues that arise that can affect the progress of the plan. Formative evaluation can help manage upswings and downturns as the plan unfolds. Middle schools should be flexible in applying for grants that support the initiatives, focus on professional development, and add importance to the long-range plan. In addition the school should be prepared for loss of funding due to unforeseen circumstances, and have a backup plan that will help to continue progress until conditions can be returned to the previous levels of support.
7. Create an evaluation plan that facilitates a process that measures progress and effectiveness of the goals and strategies developed in the technology plan (Bernhardt, 2004).

Steps such as outlined above help to create a cycle of continual improvement and allow for the building to function more systemically. “Visions without systems thinking

ends up painting lovely pictures of the future with no deep understanding of the forces that must be mastered to move from here to there” (Senge, 2006).

Suggestions for Future Research

This study aimed to examine middle school educators’ perspectives on the use of technologies in their academic setting. Specifically, to look at teacher and principal engagement and implementation limitation related to the use of technology in the educational environment of middle school students. Certainly from this small study we can see that teachers and principals are moving toward a more ubiquitous approach to technology use in classroom instruction, learning, and assessment. Although a larger study for the state of New Jersey may help to identify trends across more diverse district factor groupings, a more beneficial study might seek answers specifically about the types of technology engagement that is occurring in classrooms. Research such as this must include not only perceptual data, but also practical data collected through direct observation and or video.

Since financial considerations must be taken into account in order to sustain solid technology programs further research might help a district to examine practices that allow for budgets to stretch their dollars and implement technology programs that support the entire school community. Examples such as BYOD programs, shared use programs, where the community supports technology through paid programs in the afternoon and evening, or local educational foundation support.

Additional focus points of the study may be considered meaningful to investigate. As an example, it would be fascinating to delve into the specifics of the types of professional development offered to teachers and principals. Are the workshops or

courses general overviews? Are the professional development moments focused on specific areas of instruction, content, or methods? How are teachers supported and held accountable after the professional development has occurred?

Lastly, further research on the impact of teacher preparation and graduate programs may benefit middle level schools. If in fact pre-service teachers and graduate students are being provided with quality technology integration courses and asked to use those skills both in coursework assignments, as well as student teaching experiences, will these experiences translate to high comfort levels for teachers that work in middle level classrooms?

Conclusion

This study has indicated that teachers and principals in middle level education in Morris County, New Jersey perceive that technology is either important or very important to the learning environment within the classroom. Although educators believe that the use of technology can be time consuming they are willing to adventure into the digital environment and support today's learner. Importance is given to the value of consistent and productive professional development in order to keep teachers and principals using current skills found in the technological advances and how these advances affect teaching and learning.

Although middle level educators have access to a variety of technological equipment it is still unclear how this equipment is being used throughout the curricula. There is no doubt that equipment such as digital cameras, scanners, video recorders, and active boards are important. But the question must be raised as to how, when, and if the funding that already has supported technology is being used appropriately.

In an article written in *Education Week* published in 2011 we see part of the issue in dealing with research in schools regarding technology, teaching, and learning.

While there is much on-going research on new technologies and their effects on teaching and learning, there is little rigorous, large-scale data that makes for solid research, education experts say. The vast majority of the studies available are funded by the very companies and institutions that have created and promoted the technology, raising questions of the research's validity and objectivity. In addition, the kinds of studies that produce meaningful data often take several years to complete—a timeline that lags far behind the fast pace of emerging and evolving technologies. (Ash, 2011)

Undoubtedly, further research is needed to clarify the issues concerning teachers' and principals' perspectives on technology use in middle schools, but this research must focus on the ways to support students, teachers and principals with direct findings that give insight into best practices concerning technology for teaching and learning. As schools continue to implement programs and teachers try to keep up with the ever-changing world of technology it is important that each step we take in transitioning to a digital classroom has purpose, validity, and a means to evaluate technology effectiveness. If we continue to expect educators to transition and implement technology practices then we must provide access to equipment with sustained training and plans to realize our goals. If not, we may continue the same cycle of technology infusion for years to come. In the long run, without planning, access, professional development, and evaluation, everyone in middle level education remains in a whirlwind of change.

References

- Anderson, R. E., & Dexter, S. (2005). School technology leadership: An empirical investigation of prevalence and effect. *Educational Administration Quarterly*, 41(1), 49-82. doi:10.1177/0013161X04269517
- Asan, A. A. (2003). School experience course with multimedia in teacher education. *Journal of Computer Assisted Learning*, 19(1), 21-34. doi:10.1046/j.0266-4909.2002.02602.x
- Ash, K. (2011). Effective use of digital tools seen lacking in most tech.-rich schools. *Education Week*, 30(21), 1-10. Retrieved from <http://www.edweek.org/ew/articles/2011/02/23/21computing.h30.html>
- Association for Educational Communications and Technology (AECT) Definition and Terminology Committee. (2004). *The meanings of educational technology*. Washington, DC: U.S. Government Printing Office.
- Bennett, S., Maton, K., & Kervin, L. (2008). The 'digital natives' debate: A critical review of the evidence. *British Journal of Educational Technology*, 39(5), 775-786.
- Bernhardt, V. (2004). *Data analysis for continuous school improvement* (2nd ed., pp. 161-188). Larchmont, NY: Eye On Education.
- Botterell, A. (1982, April). Why Johnny can't compute. *Microcomputing*, 10.
- Chau, P. Y. K., & Hu, P. J.-H. (2001). Information technology acceptance by individual professionals: A model comparison approach. *Decision Sciences*, 32, 699-719. doi: 10.1111/j.1540-5915.2001.tb00978.x

- Common Core Standards. (2010). *About the standards*. Retrieved from <http://www.corestandards.org/about-the-standards>
- Creswell, J. (2008a). *Educational research* (3rd ed., p. 402). Upper Saddle River, NJ: Pearson Education.
- Creswell, J. (2008b). [Web log message]. Retrieved from http://sitemaker.umich.edu/creswell.workshop/files/creswell_lecture_slides.ppt
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approach* (3rd ed., p. 4). Thousand Oaks, CA: SAGE.
- Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal*, 36(4), 813-835. Retrieved from <https://www2.bc.edu/~peck/CubanKirkpatrickPec.pdf>
- Culp, K. M., Honey, M., & Mandinach, E. (2003). A retrospective on twenty years of education technology policy. *J. Educational Computing Research*, 32(3), 279-307. Retrieved April 18, 2012, from http://ocw.metu.edu.tr/file.php/118/Week12/Culp_JECR.pdf
- Evans, J. R., & Mathur, A. (2005). The value of online surveys. *Internet Research-Electronic Networking Applications and Policy* 15, 195-219.
- Gay, S. M. (1997). *Teaching with technology: A case study of teachers' perceptions of implementing computers into the classroom*. Dissertation, The University of Nebraska – Lincoln, United States, from Dissertation & Theses @ University of Nebraska – Lincoln. (Publication No. 9805505).

- GCN Staff. (2007, December 06). 25 years: A technology timeline. *Government Computer News*. Retrieved from <http://gcn.com/articles/2007/12/06/25-years--a-technology-timeline.aspx>
- Gulek, J. C., & Demirtas, H. (2005). Learning with technology: The impact of laptop use on student achievement, technology and assessment study collaborative. *The Journal of Technology, Learning, and Assessment*, 3(2). Available from <http://www.jtla.org>
- Hall, G. S. (1904). *Adolescence: Its psychology and its relations to physiology, anthropology, sociology, sex, crime, religion and education* (Vols. 1-2). New York: Appleton.
- Hart, H., Allensworth, E. Lauen, D., & Gladden, R. M. (2002, September). *Educational technology: It's availability and use in Chicago's public schools*. Chicago, IL: Consortium on Chicago School Research. Retrieved from <http://ccsr.uchicago.edu/publications/p56.pdf>
- International Society for Technology in Education (ISTE). (2007). *National educational technology standards for students: Technology foundation standards for all students*. Retrieved on January 19, 2013, from http://cnets.iste.org/students/s_stands.html
- International Society for Technology in Education (ISTE). (2011). *ISETnets*. Retrieved on January 19, 2013, from <http://www.iste.org/standards>
- International Society for Technology Education. (2013). *Iste.nets*. Retrieved from <http://www.iste.org/standards>

- Lenhart, A., Madden, M., & Hitlin, P. (2005, July). *Teens and technology youth are leading the transition to a fully wired and mobile nation*. Retrieved from http://pewinternet.org/~media/Files/Reports/2005/PIP_Teens_Tech_July2005web.pdf.pdf
- Levin, D., Arafteh, S., & Rainie-Director, L. (2002). *The digital disconnect*. Washington, DC: Pew Internet in American Life Project & American Institutes for Research. Retrieved on January 19, 2013 from <http://epsl.asu.edu/epru/articles/EPRU-0208-36-OWI.pdf>
- Liu, Y., & Huang, C. (2005, March). Concerns of teachers about technology integration in the USA. *European Journal of Teacher Education*, 28(1), 35-47.
- Maday, T. (2008). *Stuck in the middle: Strategies to engage middle-level learners*. Washington, DC: The Center for Comprehensive School Reform and Improvement.
- Manning, M. L. (1997, Fall). Interview by M. I. Manning [Personal Interview]. An interview with Dr. John H. Lounsbury. *Childhood Education*, 73(5), 262-266.
- McKenzie, J. (2004). Stuffing technology into the curriculum. *From Now On The Educational Technology Journal*, 13. Retrieved from <http://www.fno.org>
- McNeeley, B. (2005). *Using technology as a learning tool, not just a cool new thing*. Retrieved from www.educause.edu/Resources/EducatingtheNetGeneration/UsingTechnologyasaLearningTool/6060
- Merriam, S. (2009). *Qualitative research: A guide to design and implementation* (2nd ed., pp. 220-229). San Francisco, CA: John Wiley.

- Meyer, R. (2007). *A case study of one-to-one computing: The effects on teaching and learning*. (Doctoral dissertation, University of Nebraska). Available from ProQuest (9780549336822). Retrieved from <http://0-search.proquest.com.library.unl.edu/docview/304839961/fulltextPDF/138C45FEEDB51A58ADD/1?accountid=8116>
- Murdock, E. (2011). *History, the history of computers, and the history of computers in education*. Retrieved from <http://www.csulb.edu/~murdock/histofcs.html>
- National Center for Educational Statistics. (2010). *Digest of educational statistics*. Retrieved from http://nces.ed.gov/programs/digest/d10/tables/dt10_108.asp
- National Staff Development Council. (2012). *Definition of professional development*. Retrieved from <http://www.learningforward.org/who-we-are/professional-learning-definition#.UEfwAqSXRps>
- New Jersey Department of Education. (2004). *New Jersey Department of Education District Factor Group (DFG) for School Districts*. Retrieved from <http://www.nj.gov/education/finance/sf/dfg.shtml>
- New Jersey Department of Education. (2010a). *Professional standards and learning*. Retrieved from <http://www.state.nj.us/education/profdev/profstand/>
- New Jersey Department of Education. (2010b). *Technology standards learning progressions*. Retrieved from New Jersey Department of Education website: <http://www.state.nj.us/education/cccs/progressions/8/8.htm>
- Nunley, K. F. (1996). Going for the goal: Multilevel assignments cater to students of differing abilities. *The Science Teacher*, 63(9), 52-56.

- Palak, D., & Walls, R. T. (2009). Teachers' beliefs and technology practices: A mixed methods approach. *Journal of Research on Technology in Education*, 41(4), 417-441.
- Park, S. H., & Ertmer, P. A. (2008). Examining barriers in technology-enhanced problem-based learning: Using a performance support systems approach. *British Journal of Educational Technology*, 39, 631-643.
- Pflaum, W. (2004). *The technology fix: The promise and reality of computers in our schools* (pp. 201-222). Alexandria, VA: Association for Supervision and Curriculum Development.
- Phillips, A. (2009). *The effects of student-centered, technology-based instruction on the intrinsic motivation of secondary students*. (Master's thesis, Valdosta University)
Retrieved from http://chiron.valdosta.edu/are/litreview_vol4no2.htm
- Piaget, J., & Inhelder, B. (1969). *The psychology of the child* (H. Weaver, Trans.) New York: Basic Books.
- Pierce, R., & Ball, L. (2009). Perceptions that may affect teachers' intention to use technology in secondary mathematics classes. *Springer Science + Business Media B.V.*, 71, 299-317.
- Pitler, H. (2011). So many devices, so little use. *THE Journal*, 38(6), 42-44. Retrieved from <http://thejournal.com/articles/2011/06/17/so-many-devices-so-little-use.aspx>
- Prensky, M. (2001, October). Digital natives, digital immigrants. *On the Horizon*, 9(5).
- Raths, D. (2012). Are you ready for byod? *THE Journal*, 39(4), 28-32. Retrieved from http://www.nxtbook.com/nxtbooks/1105/journal_201205/

- Reid, R., Gonzalez, J. E., Nordness, P. D., Trout, A., & Epstein, M. H. (2004). A meta-analysis of the academic status of students with emotional/behavioral disturbance. *The Journal of Special Education, 38*(3), 130-143.
doi:10.1177/00224669040380030101
- Rogers, P. L. (2000). Barriers to adopting emerging technologies in education. *Journal of Educational Computing Research, 22*(4), 455-472.
- Rosen, L. D., & Weil, M. M. (1995). Computer availability, computer experience and technophobia among public school teachers. *Computers in Human Behavior, 11*(1), 9-31.
- Russell, G., & Bradley, G. (1997). Teachers' computer anxiety: Implications for professional development. *Education and Information Technologies, 2*, 17-30.
- Senge, P. M. (2006). *The fifth discipline: The art & practice of the learning organization* (rev. ed., p. 12). New York: Doubleday Currency.
- Shriner, M., Clark, D., Nail, M., Schlee, B., & Libler, R. (2010). Social studies instruction: Changing teacher confidence in classroom enhanced by technology. *The Social Studies, 101*, 37-45.
- Sivin-Kachala, J., & Bialo, E. (2000). *2000 research report on the effectiveness of technology in schools* (7th ed.). Washington, DC: Software and Information Industry Association.
- Smith, W. (2008). *Exploring how three middle level mathematics teachers use their experiences in a professional development program* (Doctoral dissertation, The University of Nebraska – Lincoln). Retrieved on February 21, 2011, from

Dissertations & Theses @ University of Nebraska – Lincoln (Publication No. AAT 3315316).

Staples, A., Pugach, M. C., & Himes, D. (2005). Rethinking the technology integration challenge: Cases from three urban elementary schools. *Journal of Research on Technology in Education*, 37, 285–311.

Suppes, P. (1980). In R. T. Taylor (Ed.), *The computer in the school: Tutor, tool, tutee. Computer-based mathematics instruction* (pp. 213-260). New York: Teachers College Press.

Teo, T., Lee, C. B., & Chai, C. S. (2008). Understanding pre-service teachers' computer attitudes: Applying and extending the technology acceptance model. *Journal of Computer-Assisted Learning*, 24(2), 129-130.

Toepfer, C. F. (1988). What to know about your adolescents. *Social Education*, 52(2), 110-112.

United States Census Bureau. (2011). *Back to school: 2010-2011*. Retrieved from http://www.census.gov/newsroom/releases/pdf/cb10ff-14_school.pdf

United States Census Bureau. (2012). *Table 255: Public elementary and secondary school teachers—Selected characteristics: 2007 to 2008*. Retrieved from <http://www.census.gov/compendia/statab/2012/tables/12s0255.pdf>

United States Department of Education. (2010). *Race to the top executive summary*. Retrieved from <http://www2.ed.gov/programs/racetothetop/executive-summary.pdf>

United States Department of Education. (2011, December 23). *Department of Education awards \$200 million to seven states to advance k-12 reform*. Retrieved from

<http://www.ed.gov/news/press-releases/department-education-awards-200-million-seven-states-advance-k-12-reform>

- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186–204.
- Wang, F., & Reeves, T. C. (2003) Why do teachers need to use technology in their classrooms? Issues, problems, and solutions. *Computers In Schools*, 20(4), 51-63.
Retrieved from
http://mdougla.bgsu.wikispaces.net/file/view/Computers_in_Schools.pdf
- Wiske, S. (2001). A new culture of teaching in the 21st century. In D. T. Gordon (Ed.), *The digital classroom* (pp. 69-77). Cambridge, MA: Harvard Education Letter.
- Wright, K. B. (2005), Researching internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication*, 10. doi: 10.1111/j.1083-6101.2005.tb00259.x
- Zhao, Y., Pugh, K., Sheldon, S., & Byers, J. L. (2002). Conditions for classroom technology innovations. *Teachers College Record*, 104(3), 482-515.

Appendix A

Internet Survey Instrument for Quantitative Data

Technology Use in Middle Schools

The use of technology has grown exponentially in the last decade. This study aims to examine middle school teacher and principal perspectives and beliefs on the use of technologies in their academic setting. Specifically, it aims to look at teacher engagement and implementation related to the use of technology in the classrooms of middle school students.

Directions - Please answer the following questions concerning your experience with technology in the field of education. Most questions presented have single answers, with the exception of questions concerning ranking or adding additional information. This survey should take approximately nine minutes to complete. Thank you for taking the time to complete this survey.

1. Select one category.
☐ Teacher
☐ Principal

2. Do you have classroom use of the following equipment (select all that apply):
☐ Desktop computer
☐ Interactive White Board
☐ Laptop computer
☐ Smart Phone
☐ Tablet / iPad
☐ Unsure
☐ None of the above

3. Do you have access to the following equipment (select all that apply):
☐ Desktop computer
☐ Interactive White Board
☐ Laptop computer
☐ Smart Phone
☐ Tablet / iPad
☐ Unsure
☐ Other _____

4. I have access to technology devices that work with the interactive white boards such as classroom voters or other handheld devices.
☐ Yes
☐ No
☐ Unsure

5. If you answered yes to the previous question, do you have access to a full classroom set (25) or more?
- ☐ Yes
☐ No
☐ Unsure
6. I have access to the following technology tools (select all that apply):
- ☐ CD/DVD Burner
☐ Digital Camera
☐ Document Camera
☐ Flatbed Scanner
☐ Internet Access
☐ Tablet
☐ Video Camera (or Flip)
7. My school or district offers periodic (once or twice per year) professional development in the area of technology or technology integration.
- ☐ Yes
☐ No
☐ Unsure
8. If given the opportunity could you list the perceived limitations of technology in the classroom?
- ☐ Yes
☐ No
☐ Unsure
9. Do you believe that most students in today's middle school classrooms are equipped to handle technology for educational purposes?
- ☐ Yes
☐ No
☐ Unsure
10. Thinking about your use of technology as an instructional tool in the classroom rate yourself as to the frequency of technology use on a weekly basis.
- ☐ Less than once per week
☐ Once per week
☐ Twice per week
☐ Three times per week
☐ Four times per week
☐ Five times per week

11. What value do you place on the use of technology as an instructional tool in the classroom?

☐ Very valuable
☐ Valuable
☐ Neither Valuable or Non-Valuable
☐ Moderately Valuable
☐ Not Valuable at all

12. If you checked Valuable or Very Valuable in question 11, would you be willing to be interviewed concerning your perspectives on technology in the middle school classroom?

☐ Yes, **my email contact is:**
☐ No
☐ Skip this question

13. In rank order, with “1” one being the least likely reason and “6” being the most likely, number the reasons why you feel technology may be limited in classroom use. Use each number only once.

	Less Limited			Most Limited		
Frequency of professional development	1	2	3	4	5	6
Lack of equipment	1	2	3	4	5	6
Professional development in technology is not applicable to what I teach	1	2	3	4	5	6
Takes too much time	1	2	3	4	5	6
Unsure of result	1	2	3	4	5	6
Unreliable	1	2	3	4	5	6

14. Are you able to design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary technology tools and resources to maximize content learning?

☐ Yes
☐ No
☐ Somewhat

15. Are you able to exhibit fluency in technology systems, skills, and work processes that represent a teacher or principal in a global and digital society?

☐ Yes
☐ No
☐ Somewhat

16. If you are a teacher please skip to the next question. As a principal does, your perspective on technology include a comprehensive technology plan that integrates technology to promote student achievement and support organizational change?

☐ Yes
☐ No
☐ Somewhat

17. From your perspective does your school have an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources?

☐ Yes
☐ No
☐ Somewhat

18. What is your gender?

☐ Female
☐ Male

19. Which category below includes your age?

☐ 21-29
☐ 30-39
☐ 40-49
☐ 50-59
☐ 60-69
☐ 70-80

20. How many years have you been teaching?

☐ 1-5
☐ 6-10
☐ 11-15
☐ 16-20
☐ 21-25
☐ 25-30
☐ 31-35
☐ 36-40
☐ 41-45
☐ 45-50
☐ 50 or more

21. I used technology (computers or internet) in high school.

☐ Yes
☐ No

- _____ Unsure
22. I used technology (computers or internet) in my UNDERGRADUATE coursework.
_____ Yes
_____ No
_____ Unsure
23. I use or used technology (computers or internet) in my GRADUATE coursework.
_____ Yes
_____ No
_____ Unsure
24. Grade Level (Select the level(s) you have the greatest instructional contact with in the school setting.)
_____ 6
_____ 7
_____ 8
25. What is the highest level of school you have completed or the highest degree you have received?
_____ Bachelor degree
_____ Masters degree
_____ Doctorate

Thank you for taking the time to complete this survey. If you would like results of the survey please contact me at markmajeski@yahoo.com.

Appendix B

Interview Questions

Technology in the Middle School Classroom
Interview Questions for Qualitative Data

Demographic Questions

1. What is your current position in the school?
2. How long have you been in this position?
3. How long have you been teaching middle school?
4. What is your highest education level completed?

Technology Questions

5. Describe how you currently use technology in the classroom?
6. What trainings have been instrumental in your continued use of technology in the classroom?
7. What value do you place on the use of technology as an instructional tool in the classroom? Why?
8. What specific role(s) do you see technology playing in the classroom for you? For students?
9. On a scale of one to five, with one being the lowest score of implementation and five being the highest score of implementation, where do you see yourself as an educator who uses technology as a common tool in teaching?
10. What limitations do you perceive as obstacles to including technology and integrating it into your classroom?
11. What allows you to implement technology more frequently and engage students in active learning?
12. How are you required to use technology in your current teaching position? How?

Appendix C

Additional Reading

Additional Reading

- Brown, S. Massey, A., Montoya-Weiss, M., & Burkman, J. (2002). Do I really have to?.
- User acceptance of mandated technology. European Jr. of IS, 11*, 283-95.
- Cuban, L. (2001). *Oversold and underused: Reforming schools through technology, 1980-2000*. Cambridge MA: Harvard University Press.
- Davis, F. (1985). Perceived usefulness, perceived ease of use, and user acceptance of informational technology. *MIS Quarterly, 13*(3), 319-40.
- Hu, P. J. H., Clark, T. H., & Ma, W. W. (2003). Examining technology acceptance by school teachers: A longitudinal study. *Information & Management, 41*(2), 227-241.
- Lee, Y., Kozar, K. A., & Larsen, K. R. T. (2003). The technology acceptance model: past, present, and future. *Communications of the AIS, 12*(50), 752-780.
- Ma, W. W. K., Andersson, R., & Streith, K. O. (2005). Examining user acceptance of computer technology: An empirical study of student teachers. *Journal of Computer Assisted Learning, 21*(6), 387-395.
- Reid, R., Gonzalez, J. E., Nordness, P. D., Trout, A., & Epstein, M. H. (2004). A meta-analysis of the academic status of students with emotional/behavioral disturbance. *The Journal of Special Education, 38*(3), 130-143.
- doi:10.1177/00224669040380030101.
- Yuen, A. H., & Ma, W. W. (2002). Gender differences in teacher computer acceptance. *Journal of Technology and Teacher Education, 10*(3), 365-382.

Appendix D

IRB Approval



February 4, 2013

Mark Majeski
 Department of Educational Administration
 1087 Madison Avenue
 Rahway, NJ 07065

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

IRB Number:

Project ID: 13178

Project Title: Middle School Teachers and Principals Perspectives on Technology

Dear Mark:

The Institutional Review Board for the Protection of Human Subjects has completed its review of the Request for Change in Protocol submitted to the IRB.

1. It has been approved to change the title of the study to: Middle School Teachers and Principals Perspectives on Technology. The letters, informed consent forms, and permission letters have been adjusted to represent the title change.
2. It has been approved to revise the survey questions to represent changes.
3. You have permission to conduct the research at the following schools: School District of the Chathams, Randolph Township Public Schools, Roxbury Township Public Schools, Denville Township Schools, Madison Borough, Hanover Township Public Schools, Mt Olive Township School District, and Mt Arlington School District.
4. The approved informed consent documents have been uploaded to NUgrant (files with -Approved.pdf in the file name). Please use these documents to distribute to participants. If you need to make changes to the documents, please submit the revised documents to the IRB for review and approval prior to using them.

We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

* Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;

* Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;

* Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;

* Any breach in confidentiality or compromise in data privacy related to the subject or others; or

* Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This letter constitutes official notification of the approval of the protocol change. You are therefore authorized to implement this change accordingly.

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

Sincerely,



Becky R. Freeman

for the IRB



Appendix E

Letter to School Superintendents & Sample Permission Letter



Dear Superintendent:

In recent years questions concerning technology use in classrooms is a focus point for many schools. My name is Mark Majeski, and I am a doctoral candidate at the University of Nebraska-Lincoln and a principal in the Florham Park Public Schools. I am conducting a research study on the perceived use of technology in classrooms at the middle level grades. This study aims to examine middle school teacher and principal perspectives and beliefs on the use of technologies in the academic setting. Specifically, to look at teacher engagement and implementation limitation related to the use of technology in the educational environment of middle school students. Determining the factors that enhance or may limit technology integration into the middle school curricula may help stakeholders to make decisions that will increase the use of technology in a more active, concerted, and useful manner for students in a middle level setting.

Schools currently identified as having middle level grades including grades six, seven, and eight are the focus grade levels for this study. You are receiving this letter because your district has a school that falls within this category. There are no known risks associated with this research. The identities of the schools and individuals participating in this research are confidential. All data generated by this project will be reported in an aggregated format that prevents identification of individuals, schools, or districts. You are free to decide not to participate in this study or to withdraw the school in your district from this study at any time without adversely impacting your district's relationship with the investigator or the University of Nebraska. Your decision will not result in any loss of benefits to which your school is otherwise entitled.

Please send us a brief letter (sample provided) on your district's letterhead giving us your permission to conduct research at this school in your district. A self-addressed envelope is provided for your letter. Please respond no later than March 23, 2013 so that I can begin the study.

If you have any questions or concerns about this study, please contact me at (732) 423-9873 or markmajeski@yahoo.com. Thank you for your cooperation with this important project.

Sincerely,

Mark Majeski
College of Education and Human Sciences
University of Nebraska- Lincoln
markmajeski@yahoo.com

Jody C. Isernhagen, Ed.D.
Supervising Investigator
College of Education and Human Sciences
jisernhagen3@unl.edu

Appendix F

Survey Consent Form

DISTRICT LETTERHEAD

(date)

Mark Majeski
1087 Madison Avenue
Rahway, New Jersey 07065-1802

Dear Mr. Majeski:

Our district, (**district name**), will allow schools in our district, to participate in the research study concerning The Perceived Use of Technology in Classrooms at the Middle Level Grades, conducted by Mark Majeski.

Sincerely,

Name
Title

Appendix G

Email to School Principals

**The Perceived Use of Technology in Classrooms at the Middle Level Grades
Survey Consent Form**

Dear Educator,

In recent years questions concerning technology use in classrooms is a focus point for many schools. My name is Mark Majeski, and I am a doctoral candidate at the University of Nebraska-Lincoln and a principal in the Florham Park Public Schools. I am conducting a research study on the perceived use of technology in classrooms at the middle level grades. This study aims to examine middle school teacher and principal perspectives and beliefs on the use of technologies in the academic setting. Specifically, to look at teacher engagement and implementation limitation related to the use of technology in the educational environment of middle school students. The information obtained from this study will be helpful to all New Jersey educators, institutions of learning, and policy makers as we work together in the education of the students in our state.

You have been selected to participate in the survey because the information provided through your school's website indicates that you are a teacher or principal at the middle level school. There are no known risks associated with this research. The identities of the schools and individuals participating in this research are confidential. All data generated by this project will be reported in an aggregated format that prevents identification of individuals or schools. Administrators and teachers who wish to participate will access the online survey after reading this informed consent and will click "I agree to participate" to be taken to the survey which should take around 10 minutes to complete. In addition, you may be contacted to take part in a face- to- face interview. **Completion of the survey will imply consent.**

Participation is completely voluntary and you are free to decide not to participate in this study or to withdraw from this study at any time without adversely impacting your school's relationship with the investigators, your school district, or the University of Nebraska-Lincoln. Your decision will not result in any loss of benefits to which you are otherwise entitled. If you have any questions about your rights as a research participant or to report any concerns, you should contact the University of Nebraska-Lincoln Institutional Review Board at 402-475-6965.

If you are not interested in participating in this survey, please indicate so by marking "I decline" at the bottom of this communication and return this communication by replying to this email communication. By completing and submitting the survey, you are implying your consent, which indicates that you agree to participate and have read and understand the information provided in this communication. Please complete the survey within one week of receiving this communication.

Thank you for your time and help with this important project. I DECLINE _____

Sincerely,

Mark Majeski
Doctoral Candidate
College of Education and Human Sciences
University of Nebraska-Lincoln
markmajeski@yahoo.com

Jody C. Isernhagen, Ed.D.
Assistant Professor
College of Education and Human Sciences
402-472-1088
jisernhagen3@unl.edu

Date

Principal
School
Address
Address

Dear Principal:

In recent years questions concerning technology use in classrooms is a focus point for many schools. My name is Mark Majeski, and I am a graduate student at the University of Nebraska-Lincoln and a principal in the Florham Park Public Schools. I am conducting a research study on the perspectives of teachers and principals concerning technology in classrooms at the middle level grades. This study aims to examine middle school teacher and principal perspectives and beliefs on the use of technologies in the academic setting. Specifically, to look at teacher engagement and implementation limitations related to the use of technology in the educational environment of middle school students. Determining the factors that enhance or may limit technology integration into the middle school curricula may help stakeholders to make decisions that will increase the use of technology in a more active, concerted, and useful manner for students in a middle level setting.

We have been given permission by Superintendent to invite your school to participate in this study on technology. In February 2013, you will receive an email containing the informed consent form electronically. I ask that you forward the email to teachers in your building. Teachers who wish to participate will access the online survey after reading the informed consent and clicking on the “I agree to participate” link. Completion of the survey will imply consent. A sample of the informed consent is attached for your review. I ask for your cooperation in making this survey available to the staff at your school.

There are no known risks associated with this research. The identities of the schools and individuals participating in this research are confidential. All data generated by this project will be reported in an aggregated format that prevents identification of individuals or schools. You are free to decide not to participate in this study or to withdraw your school from this study at any time without adversely impacting your school’s relationship with the investigator or the University of Nebraska. Your withdrawal will not result in any loss of benefits to which your school is otherwise entitled.

If you have any questions or concerns about this study, please contact me at (732) 423-9873 or markmajeski@yahoo.com. Thank you for your help with this important project.

Sincerely,

Mark Majeski, Principal Investigator
College of Education and Human Sciences
University of Nebraska-Lincoln
markmajeski@yahoo.com

Jody C. Isernhagen, Ed.D.
Supervising Investigator
402-472-1088
jisernhagen3@unl.edu

**Middle School Teachers and Principals Perspectives on Technology Survey
Consent Form**

Appendix H

Email to Teachers & Follow-Up Email

Dear Educator,

In recent years questions concerning technology use in classrooms is a focus point for many schools. My name is Mark Majeski, and I am a doctoral candidate at the University of Nebraska-Lincoln and a principal in the Florham Park Public Schools. I am conducting a research study on the perspectives of technology in classrooms at the middle level grades. This study aims to examine middle school teacher and principal perspectives and beliefs on the use of technologies in the academic setting. Specifically, to look at teacher engagement and implementation limitations related to the use of technology in the educational environment of middle school students. The information obtained from this study will be helpful to all New Jersey educators, institutions of learning, and policy makers as we work together in the education of the students in our state.

You have been selected to participate in the survey because the information provided through your school's website indicates that you are a teacher or principal at the middle level school. There are no known risks associated with this research. The identities of the schools and individuals participating in this research are confidential. All data generated by this project will be reported in an aggregated format that prevents identification of individuals or schools. Administrators and teachers who wish to participate will access the online survey after reading this informed consent and will click "I agree to participate" to be taken to the survey which should take around 10 minutes to complete. In addition, you may be contacted to take part in a face- to- face interview. **Completion of the survey will imply consent.** Participation is completely voluntary and you are free to decide not to participate in this study or to withdraw from this study at any time without adversely impacting your school's relationship with the investigators, your school district, or the University of Nebraska-Lincoln. Your decision will not result in any loss of benefits to which you are otherwise entitled. If you have any questions about your rights as a research participant or to report any concerns, you should contact the University of Nebraska-Lincoln Institutional Review Board at 402-475-6965. If you are not interested in participating in this survey, please indicate so by marking "I decline" at the bottom of this communication and return this communication by replying to this email communication. By completing and submitting the survey, you are implying your consent, which indicates that you agree to participate and have read and understand the information provided in this communication. Please complete the survey within one week of receiving this communication. Thank you for your time and help with this important project. Please select one statement:

 I AGREE TO PARTICIPATE

 I DECLINE

Sincerely,

Mark Majeski

Doctoral Candidate

College of Education and Human Sciences University of Nebraska-Lincoln markmajeski@yahoo.com

Jody C. Isernhagen, Ed.D.

Assistant Professor

College of Education and Human Sciences 402-472-1088

jisernhagen3@unl.edu

Follow Up Email

Dear Educator:

Two weeks ago you received an e-mail message asking you to assist us in collecting information concerning perceptions regarding technology in the middle school classrooms. If you have completed the survey, thank you!

If you have not had a chance to complete the survey yet, we would appreciate you reviewing the communication below and completing the survey. Your participation will be greatly appreciated.

I have asked your principal to forward this email to everyone in the selected sample population. Since no personal data is retained with the surveys for reasons of confidentiality, we are unable to identify whether or not you have already completed the survey. We would appreciate your response no later than March 23, 2013. The link to survey is found in the consent form below.

Sincerely,

Mark Majeski
College of Education and Human Sciences
University of Nebraska- Lincoln
markmajeski@yahoo.com

Jody C. Isernhagen, Ed.D.
Supervising Investigator
College of Education and Human Sciences
jisernhagen3@unl.edu

Appendix I

Phone Script for Selected Teachers and Principals

Middle School Teachers and Principals Perspectives on Technology

Phone Script for Potential Interviews

Mark Majeski
IRB Project 13178

Hello, my name is Mark Majeski, and I am a doctoral candidate at the University of Nebraska-Lincoln and a principal in the Florham Park Public Schools. I am conducting a research study on the perceived use of technology in classrooms at the middle level grades. The study aims to examine middle school teacher and principal perspectives and beliefs on the use of technologies in the academic setting. Specifically, to look at teacher engagement and implementation limitation related to the use of technology in the educational environment of middle school students.

Part of the study includes a face-to-face interview, at which I will ask nine questions concerning technology and four demographic questions. For accuracy purposes the interview will be recorded. There are no known risks associated with this research, and identities of the schools and individuals participating in this research are confidential. All data generated by this project will be reported in an aggregated format that prevents identification of individuals or schools. The survey will take approximately 30 – 45 minutes, and I can schedule it at your convenience. I was wondering if you might be interested in participating in this research study.

If **yes**, then, “Thank you, can we set up a date and time to schedule the interview?”
“Thank you. I look forward to meeting you on At” “Have a good day.”

If **no**, then, “Thank you for your time. I appreciate you listening. Have a good day.”

Appendix J

Informed Consent for Teachers and Principals Interviews



Interview Informed Consent

This study aims to examine middle school teacher and principal perspectives and beliefs on the use of technologies in the academic setting. Specifically, to look at teacher engagement and implementation limitation related to the use of technology in the educational environment of middle school students. The information obtained from this study will be helpful to all New Jersey educators, institutions of learning, and policy makers as we work together in the education of the students in our state.

You have been selected to participate in the face-to-face interview portion of the study because the information provided through your school's website indicates that you are a teacher or principal at the middle level school. There are no known risks associated with this research. The identities of the schools and individuals participating in this research are confidential. All data generated by this project will be reported in an aggregated format that prevents identification of individuals or schools.

There are no known risks associated with this research. The benefit of participating in this research is having a voice in providing valuable information to all educators, school districts, the state department of education, and educational policy partners about the use of technology in middle school classrooms.

You have been asked to participate in an interview conducted at your school and at your convenience by faculty or staff members affiliated with the University of Nebraska, or their designated representatives. To ensure accuracy, and with your permission, we would like to audio record the interview. Career related demographic data, i.e., position, years of service, etc., will be asked for the purpose of data analysis. The interview will require only 30 to 45 minutes of your time. The information gathered in this study will be reported in aggregated form and may be published in other written reports or in educational journals. Participant identity, both individual and district, is strictly confidential.

You are free to decide not to participate in this study, to decline to answer any question, or to withdraw from this study at any time without adversely impacting your relationship with your district, the investigators, or the University of Nebraska. Your decision will not result in any loss of benefits to which you are otherwise entitled. You are encouraged to ask questions concerning the research before or after agreeing to participate in the study or at any time during the interview. Please contact Principal Investigator Mark Majeski at markmajeski@yahoo.com or Supervising Investigator Jody Isernhagen at (402) 472-1088 or jisernhagen3@unl.edu with any questions you may have regarding our research or this project. If you have any questions about your rights as a research participant that have not been answered by the investigator, or to report any concerns you may have about our study, you may contact the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965.

Your signature certifies that you have read and understood the information presented and you have voluntarily agreed to participate in this interview. You will be given a copy of this informed consent to keep.

☐ I give my permission to audio record this interview.

Signature of Participant

Date

Appendix K

Project Budget

Project Budget

This research project included the use of an Internet-based survey system, email, and personal interviews for data gathering. The analysis of survey data was accomplished with Excel and SAS. The analysis of qualitative data was accomplished using Word. The programs used to complete the research were personal or given to the researcher free of charge. There were no other associated fees or costs associated with the research.

Appendix L

Michael O'Brian's Resume and Letter

Michael P. O'Brien

4 Dundee Road
 Kendall Park, NJ 08824
www.linkedin.com/in/michaelobrien91

(732) 297-0937 HOME
 (908) 217-7987 CELL
rugrad91@verizon.net

PROFESSIONAL PROFILE

- Master's level statistician & Certified Base SAS Programmer with extensive experience in both business and academic environments.
- Project leader leveraging exceptional analytical, communication, leadership and organizational skills to analyze and interpret data.
- Trained by industry experts in protocol design, Good Clinical Practices (GCP), SOP's and drug development process during 12 years of Phase-1, clinical research experience.
- Proficient in explanation of technical and abstract concepts to audiences of diverse educational backgrounds.

CORE SKILLS

Biostatistics for Observational Trials
 Clinical Trials

Survey Sampling

Survival Analysis

Spatial Statistics

Analytical/QC Skills

Experimental Design
 Biostatistics for
 Statistical Computing

Scientific/Technical Writing

Categorical Data Analysis

Regression Analysis

Mentoring/Training

TECHNICAL PROFICIENCIES**Languages**

SAS (5+ years)
 (3 years)

Tools

MS Office (DOC, XLS, PPT, MBS)R
 MS ProjectPascal JMP

PROFESSIONAL EXPERIENCE

Math World Statistical Consulting, Kendall Park, NJ

01/2009 - present

Statistical Consultant

Instructor

01/2009 - present

- Achieved a 95% customer satisfaction/success rate by mentoring 100+ high school and college students with high-level math/statistics tutoring.
- Prepared students for taking advanced-level examinations, including SAT and GRE.

Projects

University of Cincinnati School of Pharmacy (consulting project)

09/2012 – 11/2012

Examined cancer biomarker data in order to assist researcher in writing of presentation and journal article.

- Controlled for multiple comparisons against single control group by using Dunnett's method for t-tests.

- Conducted non-parametric test for correlation by using Spearman correlation coefficient.
- Edited statistical results section of paper and also explained all findings to researcher.

YourEncore, Princeton, NJ

05/2012 – 06/2012

Statistical/SAS Consultant (at Pfizer in Groton, CT)

Conducted targeted QC of 2 clinical trials focused on areas of statistical analysis, SAS algorithms and procedures.

- Validated clinical data by re-calculating several primary and secondary-endpoint variables using SAS.
- Ensured accuracy of data and algorithms by evaluating programming QC procedures and practices and providing recommendations for improvement.
- Verified data summaries by reviewing selected tables, listing and figures, including those in the ISE/ISS.

Aestus Therapeutics, East Windsor, NJ

03/2010 – 08/2010, 09/2010 - 09/2011

Statistical Consultant

Analyzed gene expression data to identify genes that showed biological activity in specific neurological disorders.

- Evaluated and standardized workflow for data analysis by implementing JMP Genomics and SAS for genomic data mining.
- Identified genes of potential significance by modifying software for batch processing and Meta-analysis of gene expression data.
- Determined co-regulated genes by performing QT cluster analysis and Tukey's biweight analysis.
- Identified outliers for further investigation by examining gene-pair correlation calculations.

Novo Nordisk, Princeton, NJ

08/2010-09/2010

Sr. Biostatistician (Contractor through Kelly Services)

Conducted observational studies on health claims data using statistics and SAS in the Health Economics and Outcomes Research Department.

- Determined that certain treatment regimens differed in cost, patient compliance and rate of adverse events by conducting retrospective analysis of pharmaceutical claims data.
- Prepared datasets for further statistical analysis by reducing their size using SAS and inclusion/exclusion criteria.

Bristol-Myers Squibb, Hamilton, NJ

05/1997 – 12/2008

Clinical Pharmacology Unit (CPU)

Sr. Administrative Associate

05/2008 - 12/2008

Administrative Associate

06/1999 - 05/2008

Provided administrative support to the Screening and Recruiting Departments and participated in many special projects. Distributed total yearly payments of \$2M.

- Maintained smooth operation of facility by compensating clinical trial participants through management of CPU checking account and kept customer satisfaction at high levels.
- Enabled medical staff to execute critical, clinical decisions based on real-time data by researching and resolving queries in electronic data capture system.

- Improved Recruiting department's operations by creating 2 databases of senior housing facilities.
- Brought company checking account into compliance with corporate financial standards by converting checking account to new software.
- Ensured continuity and quality of check project by taking control of project and serving as primary contact for technical support and creation of user accounts.
- Reduced the error rate of the checking records and payments by over 80% by taking the lead in training 12 coworkers on new software and by writing 40-page procedure/reference manual.
- Increased customer satisfaction by presenting a 1-hour class on MS Excel to help nursing staff expedite check requests.

SAS PROGRAMMING / TRAINING

- Performed regression analysis (linear, non-linear, and multivariate), survival analysis, categorical data analysis, logistic regression, ANOVA, and multivariate (principal component and cluster) analysis in my coursework. A listing of the class topics covered and relevant papers can be found here at <http://www.mpobrien.com/graduate-school-projects/>
- Completed five classes through the SAS Institute to prepare for my Base SAS and Advanced SAS Certifications. Also, I completed class in Clinical SAS Programming through an independent firm. More details can be found here at <http://www.mpobrien.com/SAS-Training/>

EDUCATIONAL BACKGROUND / DEVELOPMENT

- MS in Statistics (Biostatistics track), Rutgers University, New Brunswick, NJ, May 2009
- BA in Mathematics, Rutgers University, New Brunswick, NJ, May 1991
- Base SAS Certification, The SAS Institute, April 2010
- Advanced SAS Certification – Anticipated in Winter 2013
- Toastmasters International (Public Speaking & Leadership Training), March 2011 - Present

MICHAEL O'BRIEN

BIostatistician & SAS PROGRAMMER

4 Dundee Road
 Kendall Park, NJ 08824
 732.297.0937
 rugrad91@verizon.net
 www.linkedin.com/in/michaelobrien91



Certified Base
 Programmer for SAS® 9

January 7, 2013

To Whom It May Concern,

I am writing to express my interest in providing support work for Mr. Mark Majeski's dissertation. I will be providing the statistical analysis support for this research project. As for my background, I have a BA in Mathematics (1991) and an MS in Statistics (2009), biostatistics track, from Rutgers University in New Brunswick, NJ. I am Base SAS Certified which will enable me to use this software for the statistical analysis if needed.

I have worked in the pharmaceutical industry since 1997 – beginning with a support role (involving financial operations and electronic data capture) for Bristol-Myers Squibb. As far as statistical experience is concerned, I worked at Novo Nordisk in Princeton, NJ as a biostatistician in the Health Economics and Outcomes Research area. Next, I worked for 18 months at a small start-up company, Aestus Therapeutics, where I was involved in the analysis of gene expression data to determine biologically active genes in certain medical conditions. Last summer, I completed a project at Pfizer in Groton, CT, where I conducted a QC of 2 clinical trials from a statistical analysis standpoint.

Last fall, I worked on a project with Dr. Georg Weber at the University of Cincinnati - School of Pharmacy. Dr. Weber was studying tumor growth and the associated cancer biomarkers. He hired me to analyze some data for him and I completed the project successfully. As a matter of fact, we recently submitted paperwork for another proposal so we may work together again.

If you have any questions about my qualifications, please don't hesitate to contact me. I look forward to assisting Mr. Majeski on his project.

Sincerely,

A handwritten signature in cursive script that reads "Michael P. O'Brien".

Michael O'Brien, MS
 Biostatistician/SAS Programmer

Appendix M

Areas and Themes

Beliefs (B)	Barriers (b)	Practices (P)
Ability to design and implement lessons (B10)	Professional Development (b10)	Integrated (P9)
Exhibit skills (B9)	Lack of equipment (b9)	Planning (P6)
Positive (B10)	Access (b8)	Grades (P6)
Valuable (B10)	Time (b8)	Creating (P9)
Significant (B2)	Consistent (b8)	Organization (P7)
Engaged (B10)	Limitations (b10)	Social Media (P10)
Important (B10)	Trainings (b10)	Interactive (P9)
Creative (B8)	Self (b5)	Interests (P7)
Student-centered (B7)	Others (b4)	Communications (P10)
Ongoing professional development (B10)	Reliability (b6)	Accountability (P3)
Keeping current (B6)	Finances (b 4)	Research (P8)

(Letter indicates area, the number indicates the number of respondents)