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Teacher and Administrator Perceptions of Technology Use in Two West Virginia Middle Schools

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Teacher and Administrator Perceptions of Technology Use
in Two West Virginia Middle Schools

Carrie E. Marcum

Dissertation submitted to the
College of Human Resources and Education
at West Virginia University
in partial fulfillment of the requirements for the degree of

Doctor of Education
in Curriculum and Instruction

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Administrator Perceptions, Multimedia, Technology, Professional Development

ABSTRACT

Teacher and Administrator Perceptions of Technology Use in Two West Virginia Middle Schools

Carrie E. Marcum

The “digital natives” that are sitting in today’s classrooms live their lives surrounded by technology. “The current crop of learners differs in significant ways from previous generations because, unlike their predecessors, they have literally grown up ‘digital’” (Simpson & Clem, 2008, p. 2). Teachers and administrators often struggle to keep up with the technological world that students are used to. This mixed-methods study included West Virginia teachers and administrators from two middle schools. Teachers and administrators at the two schools were given surveys that addressed the following: frequency of technology use for personal and professional use, confidence level with various technology programs/tools, perceived engagement of students when technology is used by either the teacher or the students, technology professional development attended, and other technology learning experiences that has helped them learn the available technologies. Following the surveys, all teacher and administrator participants were asked to voluntarily participate in a follow up interview regarding their perceived technology skills, available technologies in their school/classroom, ideas on past and future educational technology staff development, and perceived student engagement and learning with the use of technology.

The purpose of this study was to determine how middle school teachers and administrators perceive how students are engaged when technology is used in their classrooms. Additionally, teachers’ perceptions of their own technology skills were studied to see if there was a relationship between their perceived technology skills and their attitude toward its effectiveness to engage middle school students. Teachers and administrators learning experiences regarding technology were also addressed including how they learned to use available technologies, through professional development, university courses, or personal informal training.

The study showed that the vast majority of teachers and all administrators at both schools feel that students are more engaged when technology is used in the classroom. Although a few participants addressed concerns with technology use leading to distraction or lack of content retention was addressed, overall most still believed technology was engaging and had a positive impact on instruction. The study also showed that both schools had an equal range of what was deemed for this study to be “tech confidence,” showing their confidence in technology use for personal and professional use. A relationship between “tech confidence” and perceived student engagement could not be seen within the study. Lastly, age, availability of usable and current technology, and choice were given as barriers to confidence in technology use by teachers in the classroom. Age and choice were also facilitators to confidence in using technology.

DEDICATION

This dissertation is dedicated to the fearless educators who embrace the world of “digital natives.”

ACKNOWLEDGEMENTS

Dr. Deay, you have continued to encourage and guide me through this process and have been patient beyond belief. Without your dedication, I would have given up on ever achieving this goal, for that I thank you. A special thanks to my committee members, Jim Rye, Paul Chapman, Neal Shambaugh, and Doug Smith, for bringing your individual knowledge and talents to my committee. To my parents and grandparents, I thank you for the dedication and determination that you have shown me through the years. Jeff, your support and understanding has been unyielding, for that I thank you. To my daughter, Alyson, your arrival has been the ultimate motivator to quit dragging my feet and to finish this chapter of my life. Thank you for sharing your first weeks on this earth with this dissertation, now you can have Mommy's undivided attention. Kathy Muller and Tammy Woody, you have been my sounding boards, there for me to bounce ideas off of, vent to, and push me to keep moving forward in this process and for that I thank you. Lastly, I thank God for bringing all of these wonderful people into my life to support this process and for allowing me the opportunity to continue my education so that I may better serve Him.

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CHAPTER I

INTRODUCTION

Background

Technology has become a necessity of life. The group most affected by technology is students. Students are inundated with information through technology: cell phones, internet, iPods, video games. Students walk out of classrooms at 3 o'clock and enter a world where technology rules. They turn their cell phones on, put their earbuds in (attached to their iPod), and go home to play their video games and chat online, or use social networking sites such as Facebook, MySpace, and Twitter.

Teachers have had to adapt to a technological world. In school we often teach the same way that students have been taught for years. Some teachers even think they have stepped into the 21st century when using PowerPoint instead of an overhead to give notes. Technology available for educating students far surpasses the presentation software of PowerPoint. Teachers should learn and use other technologies that are available to reach their students where they are in terms of technical advancement.

It was an eye opening experience walking into Borders bookstore in September 2008. Arriving, hoping to find research for this study in the form of educational research books, it became apparent that technology tools and program books and manuals vastly outnumbered the education texts that were available. Only one section of shelving was dedicated to Education, most of which was not research-based. In comparison, directly behind the education section, there were vast sections of shelving dedicated to technology. Ten sections of shelving were dedicated to books, mostly instruction manuals for the hundreds of technology tools and programs.

Technology is coming to the forefront in education. Its documentation is observed especially in West Virginia through the 21st Century Learning Skills and Technology Standards which must be addressed on every grade level with every student. Additionally, teachers are required to use technology. This requirement is reflected on teacher evaluations by the administrators in their building. Now, there is a new initiative in West Virginia called Global 21 which was developed to help teachers better implement technology, cooperation, collaboration, and other necessary 21st century skills into their content and classrooms.

Kids today need to know more and do more than ever before. That is why West Virginia is changing what teachers teach and how they teach from preschool to high school to improve learning. This change is fundamental and what we call Global21: Students deserve it. The world demands it. Global21 develops self-directed, motivated students who will be prepared for their future in an ever-changing world (West Virginia Department of Education, 2009).

West Virginia is leading the nation in the technology initiative in public schools, in addition to the Global21 program. A recent report, a joint project of *Education Week* and the Editorial Projects in Education Research Center, *Technology Counts 2008: STEM, The Push to Improve Science, Technology, Engineering and Mathematics*, showed West Virginia at the “top of its class for the use of technology.”

Technology Counts 2008 examined the K-12 community’s response to the United States’ perceived failings in preparing young people to thrive in a high-tech global economy. Grading was based on 14 individual indicators spanning three core areas of state policy and practice: access to instructional technology, use of technology, and capacity to effectively use educational technology. West Virginia received an “A” for access to technology. This category included the number of students in a classroom with a computer and the number of students per high-speed Internet connection. The state received an “A-” for the use of technology. This category rated each state’s use of virtual school courses and computer-based assessments. The state also received an “A” for the capacity to use technology. This category highlighted a state’s use of technology in teacher and administrator standards, license requirements and recertification requirements (West Virginia Department of Education, 2008).

Theoretical Foundations

The theoretical foundations for this study are three-fold, including how students are different and therefore learn differently due to the available technology in their lives, the engagement of students, and how teachers and administrators technology abilities relate to their perceptions of student engagement with that technology.

21st Century Learners

Marc Prensky (2001) states that “Our students have changed radically. Today’s students are no longer the people our educational system was designed to teach.” Now, with technology in nearly every aspect of our lives, how we do almost everything has changed. Prensky has named these radically different students “digital natives,” which he defines as native speakers of the digital language of computers, video games, and the Internet (Prensky, 2001). “The current crop of learners differs in significant ways from previous generations because, unlike their predecessors, they have literally grown up ‘digital’” (Simpson & Clem, 2008, p. 2). Prensky as well as Simpson and Clem believe that due to the environment, one so rich in technology, that today’s students are raised, their brains work differently, and they think and react differently to the world around them, particularly how they are taught and more importantly, how they want to be taught.

As early as 1902, Dewey observed a need for change in education, “The modification going on in the method and curriculum of education is as much a product of the changed social situation, and as much an effort to meet the needs of the new society that is formation” (Dewey, 1902, p. 6). Keeping up with the development and changes within a society are vital for education to stay relevant and important to students and to keep them engaged.

Keeping students engaged is half of the issue for teachers and administrators. If students are engaged, then usually learning comes easier. Regarding the engagement of students, Dewey (1902) stated:

Again a child's life is an integral, a total one. He passes quickly, and readily from one topic to another, as from one spot to another, but is not conscious of transition or break. There is no conscious isolation, hardly conscious distinction. The things that occupy him are held together by the unity of the personal and social interests which his life carries along. Whatever is uppermost in his mind constitutes to him, for the time being, the whole universe. That universe is fluid and fluent; its contents dissolve and re-form with amazing rapidity. But after all, it is the child's own world. It has the unity and completeness of his own life (p. 105).

Dewey understood what so many failed to see during this time period and even during this current time period, that learners need to have an interest and stake in what they are being taught in order to make it a priority and thus gain knowledge from it. Stated another way, "Research shows that when young adolescents are actively engaged in learning, they are more likely to achieve at higher levels" (Maday, 2008).

Engaging Students

Due to the importance of engagement in learning, many researchers have developed models and theories to share their ideas regarding engagement with others. "Engaging learners is considered the first 'essential' ingredient in a widely recognized inquiry model, known as the 'Five E's'" (Bybee, 1989). Bybee's "Five E's" include: Engagement, Exploration, Explanation, Elaboration, and Evaluation. Brophy (2008) states that most motivation issues in education can be classified within three major categories: social milieu, expectancy, and value. Hidi and Renninger (2006) had similar ideas to Brophy's, but describe them as phases: triggered situation interest, maintained situational interest, and emerging individual interest, and well-developed individual interest.

Teacher and Administrator Use of Technology

Because of technological advances and the availability of such technologies to students outside of school, they find themselves very engaged by the technology itself. “Media technologies such as computers, video games, and the Internet provide a mix of fun and learning in ways that schoolrooms cannot match: they are controlled by the learner, available when the learner is ready, embedded in networks of mutual interest among peers” (Senge, Cambron-McCabe, Lucas, Smith, Dutton, & Kleiner, 2000, p. 51).

Becker (2000) states that computers serve as a ‘valuable and well-functioning instructional tool’ (p.29) in schools and classrooms in which teachers: (a) have convenient access, (b) are adequately prepared, (c) have some freedom in the curriculum, and (d) hold personal beliefs aligned with constructivist pedagogy.” Judson (2006) completed a research study that investigated whether there was a connection between teacher technology integration and their beliefs about learning, particularly addressing whether or not they possessed a constructivist teaching style. He states that

Teachers possess tremendous authority to implement adoptions and adhere to classroom reforms with fidelity. This type of power is not limited to educational technology; when establishing any classroom innovation, it is the teacher who is the key determinant of implementation. When it comes to technology, teachers cannot deny the existence of technology in schools, yet how often the technology is used and how the technology is used is heavily dependent upon individual teachers (p. 583).

Levin and Wadmany (2006) conducted a study that “explores the evolution of teachers’ beliefs on learning and teaching in the context of a technology-based classroom environment, integrating technology-rich tasks (IRT) in the school curriculum.” He states that

Teacher beliefs are usually conceptualised as a tacit set of often unconsciously held assumptions regarding educational issues and processes such as teaching, learning, curriculum, schooling, and knowledge (Elen & Lowyck, 1999). Beliefs can be inferred from what people say, intend and do (Pajares, 1992), and thus they can give insight into the reasons teachers act the way they do. It is suggested that teachers’ educational beliefs

are considered a filter for teachers' instructional and curricular decisions and actions and therefore can either promote or impede change (p. 159).

Levin and Wadmany's study is based on and built on three main assumptions: teachers' beliefs come from a variety of experiences including upbringing, schooling, etc. and are subject to revision, the teacher's view of technology can be considered a major barrier to technology use within the classroom, and changing the paradigm of the teacher is complex causing a gradual change process regarding educational views.

Statement of the Problem

Marc Prensky (2010) writes in his book *Teaching Digital Natives*,

Consciously or not, all of today's teachers are preparing their students for not only the world they will face the day they leave school (a world we know), but also for a future in which within the students' working lifetimes, technology will become over one trillion times more powerful (a world we can hardly imagine). Every year of these students' lives, the world's information will explode anew: Tools will get smaller, faster, better, and cheaper; people will have access to more of these tools (and will change their behavior because of them); and schools and teachers will no doubt struggle to keep up. Given all these changes, and the new realities of students' out-of-school environment, how can teachers best prepare students for their long-term future- as well as for tomorrow- while at the same time preserving the important legacy of the past? This is not an easy question (p. 9).

Students are surrounded by technology and spend much of their time outside of school using various forms of technology to talk with friends, to get their news and current events, for entertainment, and to do their school work. The issue is that many teachers do not do these activities and have a difficult time relating to and seeing the usefulness in using such technologies for education. We have a varying spectrum of teacher attitudes toward technology and its usefulness to teach content in schools. Some teachers feel that students must have a book in their hands at all times to learn how to read, or feel that students must have a paper and pencil in front of them in order to work on a math problem, or a newspaper in their hands to research current events. Other teachers think that everything could be taught on the computer if given the

appropriate technology resources. And, of course, there are most teachers who fall in the middle of the two extremes, thinking that an appropriate balance of technology and traditional education works best.

In general, technology-based tools can enhance student performance when they are integrated into the curriculum and used in accordance with knowledge about learning. But the mere existence of these tools in the classroom provides no guarantee that student learning will improve; they have to be part of a coherent education approach (National Research Council, 2000, p. 216).

A concern is that many teachers and administrators are not prepared to use the technology in their classrooms and therefore, do not use it. This study will address the concerns of why teachers in two schools choose to use technology in their classrooms and why they do not, especially noting if there is a relationship between a teacher's perception of their own technological ability and their attitude toward that technology's effectiveness in engaging the students in their classroom. Additionally, technology skills of teachers and administrators will be questioned as well as where these educators have received professional development that has assisted in their technological growth.

There are skeptics who feel that too much time and money are spent on technology instead of better investments. Oppenheimer (2003) states that from the early 1990s to the 21st century, approximately \$70 billion was spent on technology and technology programs. He argues that even though that is not a vast amount when compared to the overall federal and state education budgets (\$4.67 trillion), \$70 billion could have hired approximately 170,000 additional teachers. Chong (2009) states "The Good, The Bad, and The Ugly" of technology in his online PowerPoint. Within the PowerPoint he lists "The Bad" as "academic honesty issues, focus on packaging not contents, poor time management in homework, distractions (mp3, aim, etc.), deteriorating source of information, triviality." Clare (2005) states "The less pupils use

computers at school and at home, the better they do in international tests of literacy and math, the largest study of its kind says today.” In this article, Clare describes his argument:

The study, published by the Royal Economic Society, said: ‘Despite numerous claims by politicians and software vendors to the contrary, the evidence so far suggests that computer use in schools does not seem to contribute substantially to students’ learning of basic skills such as maths or reading.’ Indeed, the more pupils used computers, the worse they performed, said Thomas Fuchs and Ludger Wossmann of Munich University. Their report also noted that being able to use a computer at work - one of the justifications for devoting so much teaching time to ICT (information and communications technology) - had no greater impact on employability or wage levels than being able to use a telephone or a pencil.

Another skeptic is Larry Cuban, who argues that “computers, as a medium of instruction and as a tool for student learning, are largely incompatible with the requirements of teaching” (Becker, 2000, p. 3). Becker discusses several factors that Cuban believes to interfere with the ability of teachers to utilize technology. These factors include issues such as: many students to teach, many subjects to teach (in elementary school), increased accountability demands. He also mentions the skills needed to implement and inconsistencies found when using such technology.

Purpose of the Study

The purpose of this study is to look at teacher and administrator perceptions in two schools, more specifically, to look at the perceptions of the teacher’s own technology skills and how they perceive students as being engaged or not engaged by the use of technology in their classroom. Additionally, administrator perceptions of their own technology skills, their teachers’ technology skills, and how they perceive student engagement as it relates to technology will be investigated. Teachers and administrators will also be asked where they have learned how to use available technologies, through professional development, university courses, or personal informal training. Additional demographic information such as, age range, gender, years of teaching experience, if they are or are not a certified teacher, degrees earned, children living at

home, computer and internet at home, technology professional development attended, and other technology learning experiences that have helped them learn the available technologies, will be collected from all teacher and administrator participants to allow for group themes and cross-comparison of data.

Research Questions

1. What is the perception of how students are engaged with technology?
 - a. Teacher perceptions?
 - b. Administrator perceptions?
2. How does the perception of one's own technology skills relate to one's perception of how students are engaged with technology?
 - a. Teacher perceptions?
 - b. Administrator perceptions?
3. How does an administrator's perception of their teachers' technology skills relate to the teachers' perceptions of how teachers are engaged with technology?
4. What are perceived as facilitators and/or barriers to using technology?
 - a. Teacher perceptions?
 - b. Administrator perceptions?
5. What trainings/learning experiences have been helpful in helping both teachers and administrators learn to use available technologies?
 - a. What professional development have teachers and administrators attended that has helped them to learn to use available technologies?
 - b. What additional learning experiences, professional and personal, have teachers and administrators had that has helped them to learn to use available technologies?

CHAPTER II

LITERATURE REVIEW

Within this chapter, current information related to technology-enhanced instruction to interest middle school students is discussed. Six main concepts will be addressed in six subsections. The first section will provide research on 21st century digital learners and how their technological environment has influenced how they learn, how they want to learn, and how they learn best. The second section will address how multimedia has transformed and continues to transform education, both teaching and learning. The third section will provide information on how students are engaged. This will include research on middle school-aged students as well as how students are engaged through technology tools. The fourth section will discuss research and information on teacher perceptions of technology use- their own technology abilities as well as the effectiveness of implementing it into the classroom. The fifth and final section will describe what is found in the literature discussing impacts on administrators regarding 21st Century digital learners, engagement, teacher technology skills, and teacher perceptions of student engagement when technology is used in their classrooms.

Literature Focus on 21st Century Learners

The dynamic change in technology in the past two decades has led to a vast amount of research on teaching and learning. Education has been thought of for many years as being a stagnant job, one that requires very little change. Due to the advancements in the field of technology, education is changing at a quick rate. Keeping up with the changes in society in the classroom is a must. As early as 1902, Dewey saw a need for change in education, “The modification going on in the method and curriculum of education is as much a product of the

changed social situation, and as much an effort to meet the needs of the new society that is formation.”

Marc Prensky (2001) states that, “Our students have changed radically. Today’s students are no longer the people our educational system was designed to teach.” Now, with technology in nearly every aspect of our lives, how we do everything has changed. Prensky has named these radically different students “digital natives,” which he defines as native speakers of the digital language of computers, video games, and the Internet (Prensky, 2001). “The current crop of learners differs in significant ways from previous generations because, unlike their predecessors, they have literally grown up ‘digital’” (Simpson & Clem, 2008, p. 4).

This “game generation” will soon outnumber their elders in the workplace. Their way of thinking will soon pass the business tipping point and become standard operating procedure. Sooner or later, those who grew up without video games will have to understand the gamers. That means not only learning what they’re all about, but finding ways to redesign educational and training curricula around their needs (Carstens & Beck, 2005, p. 22).

Ted McCain (2008) states it simply, “schools face a different kind of student” (p. 13). He adds that “digital technology and online experiences have already profoundly affected the minds of young people today. Research is now confirming that the interactive visual & auditory presentation of info kids experience in the digital world is actually rewiring their brains.” Though the students have changed, McCain states that most educators have not changed and “continue to teach as if its 1975.”

“Children raised with the computer ‘think differently from the rest of us. They develop hypertext minds. They leap around. It’s as though their cognitive structures were parallel, not sequential” (Winn, 1997).

The statistics tell the story: the National Institute on Media and the Family reports that 92 percent of children aged two to seventeen play video and computer games, with the percentages climbing yearly; about two-thirds of adolescents play the games daily. Sixty percent of all Americans, or about 145 million people, play interactive games on a regular

basis. Surveys of parents have indicated that children between the ages of two and seventeen spend almost six-and a-half hours a day in front of electronic screens. It used to be that a significantly higher percentage of boys than girls played video games, but the game-playing rates are equalizing now that more girl-centered games are available (Clem & Simpson, 2008, p.5).

The change in student experiences has led to a change in the way students learn. “At least 87% of students in any given classroom are NOT auditory or text-based learners. But they’re either visual or visual kinesthetic learners. They’re visual kinesthetic not to drive us crazy but because they’ve grown up that way- they’re wired for multi-media” (McCain, 2008).

According to Clem and Simpson (2008), teachers are incorporating technology tools such as video simulation games into their lesson plans and classrooms in order to reach their students:

They do so because they know that the current generation of learners is different from earlier generations. These kids have grown up in a digital environment, giving them learning patterns that researchers say are typical of ‘digital natives’: a higher need for autonomy and self-set goals; a preference for graphical devices; expectation of ‘on-demand’ learning and information; a willingness to try and fail and try again; and a liking for solving problems collaboratively, exchanging information freely while maintaining their competitiveness and individualism (Clem & Simpson, 2008, p.6).

Incorporating this technology and visual kinesthetic material and teaching methods into the classroom is one way to reach these 21st Century learners.

Schools are responsible for preparing students for the lives they will live outside of school after graduation (Prensky, 2010).

It is common knowledge that two emergent themes serve as the driving force for integrating technology into K-12 environments: preparing students for the workforce and increasing student knowledge and skills. Yet, after three decades of numerous well-funded technology initiatives, our national efforts are disappointingly meager. For example, a report from the US Department of Commerce revealed that education is ranked as the least technology-intensive enterprise among 55 US industry sectors (US Department of Commerce, 2003).

More evidence of the lack in multimedia technology as well as other 21st century skills in education comes from a survey of over 400 US employers. Casner-Lotto & Barrington state the results from that survey as showing that our high school graduates are entering

today's workforce deficient in most of the twenty-first century knowledge and skills needed to achieve successful careers (Casner-Lotto & Barrington, 2006).

Literature Focus on Multimedia in Education

“Multimedia is the integration of multiple forms of media. This includes text, graphics, audio, video, etc.” (Techterms: The Tech Terms Computer Dictionary, 2009). Asthana (2009) defines it further, stating that it combines five basic types of media into the learning environment: text, video, sound, graphics, and animation, thus “providing a powerful new tool for educators.” She also states that “the multimedia technologies that have had the greatest impact in education are those that augment the existing curriculum, allowing both immediate enhancement and encouraging further curriculum development.”

Mayer (2001) found that retention increases by an average of 23 percent when certain types of multimedia methods are used to present material. He also found that when graphics and text were combined, that retention goes up an average of 42 percent. And if the text is spoken, in other words, if students hear rather than read the text in the presentation, the retention goes up an additional 30 percent, on average. Another finding, just as important, is the “transfer” of information that students were able to generate from prior knowledge when exposed to multimedia presentations. He found that students who had been presented in a multimedia-style presentation showed an 89 percent improvement in performance over traditional book-based methods.

When many teachers hear multimedia they think of PowerPoint, but they often fail to think beyond that one method of technology delivery. “PowerPoint presentations have become the preferred method of information delivery in many classrooms” (Baker, 2008). Bartsch and Cobern (2004) conducted a study to determine whether using PowerPoint presentations during

lectures would lead to better grades and create a greater interest amongst the students as compared to using overhead transparencies. What they found was that the students believed they had learned more from the PowerPoint presentations, but there was not a statistically significant difference in their learning. The study also showed that when unrelated sounds and graphics were included, that it resulted in a “significant drop in mastery of learning.”

There are many other options to using multimedia in the classroom. A great way to stimulate interest that is relevant, immediate, and powerful is through the use of digital videos in the classroom. But, the video must go beyond traditional documentary-style movies and must be related to the curriculum. “Children grow up in a culture where most of their information comes through the mass media, and teachers can promote the development of critical thinking skills by using television and video materials as texts to be interrogated and analyzed” (Hobbs, 2006, p. 36). The Olive K-12 School in Los Angeles Unified School District has been using video streaming, particularly in their math classes. They have decided, “to connect better with their student population, the Olive Vista School teachers decided to implement an unusual technology tool not typically found in math classes. They call it video streaming” (Whitaker, 2005, p. 32). Whitaker goes on to describe the definition of video streaming, digital content accessed over the Internet from any computer, available through a variety of different carriers, some free and some through paid subscriptions. They offer thousands of clips related to all content areas. Some suggested uses from Whitaker for their Olive math classes include showing clips of skylines or forests to teach lines, planes, and rotational symmetry in art and architecture as well as showing clips of professionals using math skills in their jobs.

David Warlick reminds us that the availability of technology is a necessity for its appropriate use in the classroom. In his book, *Redefining Literacy 2.0*, Warlick (2009) states that,

These highly portable machines provide the access to information and information tools that self-learners need. We must all have ubiquitous and convenient access to digital and networked information at the point that a student (or teacher) needs it. Saying that a learner can share a networked computer with 30 other students in her class is as ridiculous today as saying that they must share a single textbook with dozens of readers (p. 8).

Equipping our classrooms, teachers, and students with appropriate technology is essential to improving literacy and engagement in the 21st century classroom.

Literature Focus on Engagement of Middle School Students

Ted McCain (2009) states that, “schools are not engaging students.” As early as 1902, education researchers are quoted stating the importance of engaging students. Dewey (1902), stated:

Again a child’s life is an integral, a total one. He passes quickly, and readily from one topic to another, as from one spot to another, but is not conscious of transition or break. There is no conscious isolation, hardly conscious distinction. The things that occupy him are held together by the unity of the personal and social interests which his life carries along. Whatever is uppermost in his mind constitutes to him, for the time being, the whole universe. That universe is fluid and fluent; its contents dissolve and re-form with amazing rapidity. But after all, it is the child’s own world. It has the unity and completeness of his own life.

Dewey understood what so many failed to see during this time period, that learners need to have an interest and stake in what they are being taught in order to make it a priority and thus gain knowledge from it. Stated another way, “Research shows that when young adolescents are actively engaged in learning, they are more likely to achieve at higher levels” (Maday, 2008).

Since Dewey, researchers have continued to explain the need to engage students in order in order to help students be successful in their learning. Some such researchers have gone on to develop models and theories to teach their ideas on engagement to others. “Engaging learners is considered the first ‘essential’ ingredient in a widely recognized inquiry model, known as the ‘Five E’s’” (Bybee, 1989). Bybee’s “Five E’s” include: Engagement, Exploration, Explanation,

Elaboration, and Evaluation. Newmann (1986) argued that engagement is difficult to define, but we recognize it when we see it. He further argued that engaged students care about their work and committed themselves to it because their work seems valuable beyond the confines of the classroom” (Harmer & Cates, 2007).

Just observing engagement and motivation can be a challenge as stated by Newmann, but the issue goes beyond simply observing it, as Dewey said, educators have to make it happen.

According to (Brophy, 2008):

Most issues in motivation in education can be classified within three major categories. First are issue relating to the *social milieu* in which the learning takes place (questions about classroom climate, learning community, classroom goals and structures, etc.). Second are issues relating to the *expectancy* aspects of individual students’ motivation (questions such as ‘What are my chances for succeeding here?’ or ‘How can I protect my reputation if I fail?’). Third are issues relating to the *value* that individual students place on engaging in a learning activity or gaining whatever benefits successful completion will bring (questions such as ‘Why should I care about this?’ or ‘What will I get out of it?’). Everyone recognizes that all three categories of issues are important. Yet, as the field developed, the social milieu aspects and the expectancy aspects got a lot of attention, but the value aspects did not (p. 1).

So this is the challenge of educators and researchers today, to focus more on the value aspect of engagement in learning. To help students see how what they are learning is of value to them in their present lives and for their future.

Similar to Brophy’s issues mentioned above are Hidi and Renninger (2006) phases of interest which they say are “characterized by varying amounts of affect, knowledge, and value”:

The first phase of interest development is a triggered situational interest. If sustained, this first phase evolves into the second phase, a maintained situational interest. The third phase, which is characterized by an emerging (or less-well developed) individual interest, may develop out of the second phase. The third phase of interest development can then lead to the fourth phase, a well-developed individual interest”... “The proposed model (a) provides a description of how interest can develop and deepen, (b) points to the need for researchers to identify the phase of interest that they are investigating and the impact of their methods on the way in which they interpret and report their findings, and (c) suggests ways in which educators could support students to develop interest for particular content (Hidi & Renninger, 2006, p. 113).

“Motivation affects the amount of time that people are willing to devote to learning” (National Research Council, 2000) and more time leads to a better chance of learning and understanding.

Capturing the attention of students in today’s society, full of vast amounts of technology and distractions has proven to be even more difficult than engaging students in Dewey’s lifetime. “In today’s world of reality TV, the Internet and video games, capturing the attention of students in science classes is becoming increasingly difficult (Castell & Jenson, 2004)” (Harmer & Cates, 2007, p. 105). “Media technologies such as computers, video games, and the Internet provide a mix of fun and learning in ways that schoolrooms cannot match: they are controlled by the learner, available when the learner is ready, embedded in networks of mutual interests among peers” (Senge et. al, 2000, p. 51).

As early as 1994, technology was mentioned as a tool to promote changes in student engagement. In Apple’s Computer’s Classrooms of Tomorrow (ACOT) Report, Apple argued that:

Technology-rich classrooms produce positive changes in student engagement, and further contented that conditions for sustaining student engagement include using technology within the context of a meaningful assignment, while allowing for exploration and experimentation (Sandholtz, Ringstaff, & Dwyer, 1994, p. 8).

As for engagement in the science content area, research is beginning to emerge. “When students move to high school, many experience disappointment, because the science they are taught is neither relevant nor engaging and does not connect with their interest and experiences” (Goodrum et al, 2001). Darby (2005) says that this “widespread disengagement” is evident from fewer students choosing science careers and those who continue to study science beyond high school. She calls it “apparent disengagement” and says it is not just noticed in science but throughout all subject areas in middle school and high school. Concern about the direction of

teaching and learning during the middle years has been sharpened with the recognition that these years should be considered an explicit stage within the schooling life of students (Darby, 2005).

In a newsletter called, *Stuck in the Middle: Strategies to Engage Middle-Level Learners*, Maday (2008) offers a great summary of what is needed in education regarding engagement in an effort to spear-head reform:

Teachers can instill the value of academic content by relating topics to past experiences and life outside the school and involving learners in tasks that reflect civic or work-world responsibilities. A relevant curriculum relates content to the daily lives, concerns, experiences, and pertinent social issues of the learners. Teachers can gain insight into student concerns by taking periodic interest inventories, through informal conversations, and from classroom dialogue.

Marc Prensky (2010) mentions teacher training as an issue. He explains how teachers were trained to tell: lecturing, presenting, explaining, also known as direct instruction. “Unfortunately, direct instruction is becoming increasingly ineffective; that too many of their teachers just talk and talk and talk is today’s students’ number-one complaint. And unfortunately, the students’ response is almost always to tune out” (p. 10). Prensky likens the student-teacher relationship to FedEx delivering a package. He says that FedEx “can have the best delivery system in the world, but if no one is home to receive the package, it doesn’t much matter.” He states that, “Too often, today’s students are not there to receive what their teachers are delivering. They are off somewhere else, often in the electronic world of 21st century music, socializing, or exploring” (Prensky, 2010, p.9).

Literature Review on Teacher Perceptions of Technology Use

Donovan, Hartley, and Strudler (2007) address the issues of the one-to-one laptop programs in schools. The purpose of their study was to examine one-to-one computing in the middle school setting from different perspectives. Their study involved 17 teachers and 2 administrators. The methodology included a stages of concern questionnaire (SoCQ) developed

by Hall and associates as well as open-ended questions, observations, and interviews. Some specific concerns that emerged from their study included “I’m worried about teaching with the laptops because I don’t really know what to do,” “I’m concerned with being able to cover all the course requirements while being bogged down with the laptops,” and “I’m concerned about ‘teaching our students all the ins and outs of the applications’” (p. 274).

Observations throughout the first year of the laptop initiative revealed that several teachers rarely used the laptops for teaching and learning, once again confirming their concerns about being proficient with the innovation. It was apparent in interviews that teachers did not feel proficient with the technology to integrate it in innovative ways. These teachers more frequently used the technology for functions they were personally comfortable with such as word processing and searching the Internet (p. 277).

It was also noted in the article that teachers were very uncomfortable blending their traditional pedagogies with the laptops environment.

Ertmer (2005) would likely agree with the results found in the one-to-one laptops study. In his article entitled “Teacher Pedagogical Beliefs: The Final Frontier in Our Quest for Technology Integration?” she states her argument for the importance of research on teacher pedagogical and technology beliefs and how it impacts their instruction. Throughout the article she cites her own experiences as well as current and past research of the topic. Ertmer states that most teachers, expert or novice, have limited experience or understanding about how technology should integrate into the educational aspects to direct teaching and learning. Teachers refer to these beliefs and experiences when trying to integrate technology into their instruction and they often struggle transitioning to such an environment. Judson (2006) wrote,

Acknowledging a continued low ratio of frequent technology users among classroom teachers, other researchers have focused on determining the confluence of factors prevalent among teachers who are frequent technology users (Becker & Ravitz, 2001). Three significant findings underscore the differences among these teachers more likely to give frequent assignments involving computer work. First, the relatively few teachers whose pedagogy involved a small number of topics covered in great depth were twice as likely as those reporting a large number of topics to assign computer activities. Secondly, teachers with five to eight computers in their classroom, compared with teachers with

access to computers limited to computer labs, were twice as likely to give students frequent computer experiences. Finally, teachers with greater technical knowledge use computers more (p. 584).

Giordano (2007) completed a research study examining the effects of Project REFLECT (Realizing Education's Future: Learning through Evolving Cyber Technologies) on the perceptions of teachers of this professional development and their instructional practices. "The Project REFLECT model is based on the understanding that teachers typically go through stages or processes prior to embracing an innovative curriculum or pedagogical practice and that this process evolves over time" (p. 113). For this professional development, two teachers from each of the 44 participating schools were selected by their administrators, they were trained together and following the training, they returned to their schools and worked as a team to plan and implement the Internet-based applications on which they were trained into their own classrooms. In addition to implementing the technology into their instruction, the selected teachers trained teachers through staff development sessions. The goals of the program were to enhance understanding of teachers of how to use the Internet as an instructional resource, to provide professional development (PD) including time to practice using the technology themselves, and time and ability to explore the effectiveness of using the Internet-based instruction in their own classroom. The study involved using stages of concern questionnaires (SoCQ) and interviews given at the beginning of the PD and after the three-year long PD. The results of the study indicated that changes in teacher concerns did occur, specifically in the awareness, information, collaboration, and refocusing stages. Additionally it seemed that as the selected participants ended with their final post-test, that many the concerns switched from how they would integrate the program into their classroom to how they could manage the task. The task management issue actually had an increase of concern from the pre-test to the post-test. From the post-test, Giordano also noted changes in practice occurred due to several factors: support, believing that

the technology enhances the learning experience for students, having authentic experience to experience the technology and how to use it in their classrooms, and how the technology was adaptable to diverse disciplines and teaching philosophies.

To not only provide access to technology for all learners in the 21st century, but also provide access to technology for all learners, teachers must first embrace the technology. This can be accomplished through effective professional development programs that promote changing teachers' beliefs to accommodate new instructional approaches within their own value system (Giordano, 2007, p. 115).

In the article, "Teacher adoption of technology: A perceptual control theory perspective," Zhao and Cziko (2001) discussed how important the role of teacher beliefs is in technology integration. They begin by introducing "a novel model of goal-oriented behavior, Perceptual Control Theory (PCT), as a framework for understanding teacher adoption of technology" (p. 8). This framework, as they call it, considers the teachers use of technology and examines teacher goals and how their technology skills and abilities might impact reaching their goals. In describing their PCT, they summarize the following necessities for teachers to want to integrate technology into their class: they must believe that technology can help them achieve higher goals more effectively and that they have adequate ability and resources to use the technology, they must feel confident that using such technology will help them better reach the needs of their students, and they must believe that they will have sufficient ability and resources to use the technology.

The lack of empirical studies notwithstanding, a set of assumptions about why teachers do not use technology does exist and is currently functioning as the theoretical base underlying many efforts to help teachers integrate technology with their teaching. Lack of suitable training, technical and administrative support, and systemic incentives (e.g., tenure and promotion), traditional pedagogical beliefs, and resistance to change are among the most widely held ones. Therefore, in order to help more teachers use technology in their teaching, educational institutions at all levels have begun to invest in providing sufficient professional development opportunities for teachers to develop technical skills while enhancing access to technological resources (Zhao & Cziko, 2001, p. 10).

Zhao and Cziko feel that the assumptions need to be addressed and teachers need to be given opportunities to feel comfortable with the technology and to realize how technology can help them meet their educational goals for their classrooms and they feel their PCT framework would be a great start in this process.

Becker (2000) states that computers serve as a ‘valuable and well-functioning instructional tool’ (p. 29) in schools and classrooms in which teachers: (a) have convenient access, (b) are adequately prepared, (c) have some freedom in the curriculum, and (d) hold personal beliefs aligned with constructivist pedagogy.” Ertmer (2005) cites several important statistics: The United States Department of Education (2003) states that a majority of teachers (85%) reported feeling “somewhat well-prepared” to use technology in their instruction and in 2000, the National Center for Education Statistics found that 53% felt somewhat prepared. Though these were not results of the same survey, they do speak of the increase in teacher feelings regarding how prepared they are to integrated technology into their instruction, though not necessarily their curriculum.

Judson (2006) completed a research study that investigated whether there was a connection between teacher technology integration and their beliefs about learning, particularly addressing whether or not they possessed a constructivist teaching style. He states that,

Teachers possess tremendous authority to implement adoptions and adhere to classroom reforms with fidelity. This type of power is not limited to educational technology; when establishing any classroom innovation, it is the teacher who is the key determinant of implementation. When it comes to technology, teachers cannot deny the existence of technology in schools, yet how often the technology is used and how the technology is used is heavily dependent upon individual teachers (p. 583).

In Judson’s study, thirty-two classroom teachers who represented various grade levels with no bias toward particular subject areas volunteered to participate. Each participant must have previously taken at least one university course or attended one district-level training on

technology in the classroom in order to participate. Participants were given the Conditions that Support Constructivist Uses of Technology (CSCUT) survey (Ravitz & Light, 2000) to measure their beliefs and attitudes regarding what makes up quality instruction and their attitudes toward technology. In addition to the surveys, teachers were observed once or twice during prearranged “technology-integrated lessons considered by the teacher to be good examples of learning” (Judson, 2006, p. 586).

Lastly, the Focusing on Integrated Technology: Classroom Observation Measurement (FIT: COM) was used to measure constructivist teaching practice when technology is used. Judson found that teaching practices (measured with the FIT: COM) did not significantly correlate to reported philosophy (CSCUT). Also, there was not a significant correlation between teaching practices and teacher attitudes toward technology. As for the observations, Judson observed a variety of teaching strategies including projecting lecture notes, multimedia presentations by the teacher and/or student, using spreadsheets for data analysis for student lab results to name a few. Results of Judson’s study showed a lack of correlations between what a teacher believes is good instruction and what is observed in their classroom. He stated that this result constitutes further research in the area of teacher attitudes toward technology and teacher practices/instructional methods.

Levin and Wadmany (2006) conducted a study that “explores the evolution of teachers’ beliefs on learning and teaching in the context of a technology-based classroom environment, integrating technology-rich tasks (IRT) in the school curriculum” (p. 157). They state that,

Teacher beliefs are usually conceptualised as a tacit set of often unconsciously held assumptions regarding educational issues and processes such as teaching, learning, curriculum, schooling, and knowledge (Elen & Lowyck, 1999). Beliefs can be inferred from what people say, intend and do (Pajares, 1992), and thus they can give insight into the reasons teachers act the way they do. It is suggested that teachers’ educational beliefs are considered a filter for teachers’ instructional and curricular decisions and actions and therefore can either promote or impede change (p. 159).

Levin and Wadmany's study is based on and built on three main assumptions: teachers' beliefs come from a variety of experiences including upbringing, schooling, etc. and are subject to revision, the teacher's view of technology can be considered a major barrier to technology use within the classroom, and changing the paradigm of the teacher is complex causing a gradual change process regarding educational views. Their study was a three-year longitudinal study that was an exploratory/collective case study involving six teachers within one school in Israel. The methodology was mainly qualitative although some results were quantified. The six teachers were selected by the principal and all were elementary level educators. Open-ended questionnaires were given to explore teachers' beliefs and were given annually for all three years of the study. Participants were observed and following the observations, were also interviewed regarding their views on the changes in their professional environment and their beliefs about teaching and learning. For analysis, a phenomenographic approach was used to look for similarities and differences. Additionally, commonalities with reference to learning, teaching, and knowledge were searched for throughout the study. Levin and Wadmany found that during the three-year study, changes occurred in the beliefs and educational practices of all six teachers. At the beginning of the study, the teachers' beliefs and metaphors used to describe teaching and learning were complementary with the metaphors confirming the positivist views expressed by most of the teachers in their statements. At the end of the three-year study, however, considerably fewer positivist beliefs were exhibited and the participants had a more varied pattern of educational beliefs, showing even more than one category of belief for at least one concept.

At the beginning of the study, all teachers used direct instruction and predetermined sequences of instruction to reach predetermined goals; after three years in a technology-rich classroom, wide divergences emerged between the teaching models teachers used. Most teachers significantly changed their classroom practices, discarding direct

instruction and adopting practices focusing on facilitating collaborative learning processes, where most emphasis was on coaching, modeling, reflection, and exploration (p. 168).

As for teachers' views on technology, Levin and Wadmany found that only three of the six teachers significantly changed their views on technology. One cause they reason to be due to the differing views of what constitutes technology. One teacher did show a dramatic shift from viewing technology as "an instrument supporting learning" to one that views technology as "a partner in individual learning and development."

Literature Review on Implication for Administrators

"What determines the instruction that takes place behind the classroom door is the teacher rather than external educational agenda or requirements" (Chen, 2008, p. 65).

Research shows that a strong indicator of student, teacher, and school success depends on access to technology and professional development and support of advocating by school principals, county superintendents, and school boards. This study directly impacts administrators on many levels. Administrators will mostly be involved in the curriculum, planning, training, and funding aspects as it relates to acquiring necessary equipment, teacher involvement and training to initiate such instruction in their schools. Administrative support is needed at all steps of this process: planning, training, and implementing.

In the classroom, teachers make most of the decisions that affect their classroom, what is taught, and how it is taught. Though more and more of this is being determined by state and county officials, the teachers still have a great opportunity to make decisions for their own classroom and their students. "In a classroom, the teacher perceives and defines a teaching situation, makes judgments and decisions, and then takes related actions. Therefore, to improve teacher preparation and teaching practice, educators should pay more attention to teacher beliefs

because those beliefs profoundly influence decision-making processes and teaching practices” (Chen, 2008, p. 66). In addition to the educators needing to pay more attention to teacher beliefs, administrators need to take note of the beliefs of their teachers. Chen (2008) goes on to say that based on their beliefs about teaching, pedagogy, student learning, teachers choose specific materials and strategies to meet the needs of the students in their class.

“Schools are not engaging students” (McCain, 2008). In “Making Schools Work in the 21st Century,” McCain tells the story of his first year of teaching and having problems with the behaviors of some of his students. He went to a master teacher for advice who told him, “The key to classroom management is an engaging methodology,” which in other words means that if your instruction is meaningful and interesting, there won’t be behavior problems.

The CEO Forum on Education and Technology (2001) describes the state of educational technology and offers six recommendations to reach their goals:

Focus education technology investment on specific educational objectives, Make the development of 21st century skills a key educational goal, Align student assessment with educational objectives and include 21st century skills, Adopt continuous improvement strategies to measure progress and adjust accordingly, Increase investment in research and development and dissemination, Ensure equitable access to technology for all students.

In talking about teaching rooms of twenty-thirty years ago, “the teaching room is becoming not only costly to equip, but costly to run and maintain, including the escalating cost of security” (Asthana, 2009). The biggest issue amongst school administrators is adequate funding. Without it, schools cannot get the equipment or train their teachers to use it in the classrooms. Without enough equipment, teachers let alone student cannot access these 21st century tools that they will need to use in their future careers. And even if teachers have the equipment but don’t feel comfortable using it due to a lack of training, it will sit on their shelves and get covered in dust.

“Teachers who may be committed to integrating computer technology in the classroom may find the process challenging due to the barriers that exist” (Keengwe, et al, 2008, p.561). These barriers include internal and external barriers. External barriers such as lack of equipment, lack of technical support, and other resource-related issues are included and internal barriers include beliefs about teaching and technology as well as a teacher’s openness to change (Snoeyink & Ertmer, 2001). Evidence of such barriers have influenced the requirements and structure of many technology initiative grants. The Federal government used an initiative called Enhancing Teaching through Technology (ETTT) to address these issues. Through this federal initiative, several state-level grants were given and through one of these, Tennessee investigated its own technology barriers through TnETL or the Tennessee EdTech Launch. The goal of this program was to integrate technology as a curriculum and instruction tool as well as prepare teachers to create student-centered environments to increase critical thinking and problem solving, important 21st century skills. What was discovered through TnETL was a list of barriers to technology integration. They included: availability and access to computers, availability and access of curriculum materials, teachers’ beliefs, teachers’ technological and content knowledge, and support (technical, administrative, and peer) (Lowther, Inan, Strahl, and Ross, 2008).

In the one-to-one laptop study (Donovan, et.al, 2007); administrators were given the stages of concern survey, open-ended questions, and interviews as were the teachers. The findings were that the administration had many concerns, including “management of the innovations,” “a desire to share the effect of the initiative with the community,” and “making sure there was adequate funding for teachers” (p. 265).

“In a large scale, nationwide survey of teachers, students, and administrators conducted for the Gates Foundation, Abbot (2003) found that over 53% of the teachers they surveyed do not routinely use technology in the classroom and over half the students

responding to questionnaires reported they use technology no more than once a week.” (Zhao & Bryant, 2006, p. 53).

“The pace of technological evolution today makes it increasingly difficult for the classroom teacher to keep up with it. Given all the duties they must attend to, little time remains to explore the options that all the various new technologies might offer” (Teacher Training and Classroom Technology Integration, 2008). Staff development, time set aside for teachers to learn new technology is essential in order for teachers to even consider implementing it into their classrooms.

Donovan, et. al (2007) reminds us that giving teachers a voice and allowing them the opportunity to state their opinions and concerns are vital. “By acknowledging teacher concerns, change facilitators can support teachers throughout the change process. It is critical that when asked to adopt an innovation teachers feel important and involved” (p. 279). This is one way that administrators and change agents can greatly influence the acceptance of new programs and the willingness to participate on behalf of their staff.

Ultimately, Donovan et. al (2007) reminds us that change is a process. He reminds us that,

We are living in a period of significant flux in education. A greater understanding of the change process by all participants should increase the likelihood that projects such as this will be effectively implemented and continued. It was recommended to the administration of this school that they do not get disheartened by the concerns of the teachers during this early phase of the program, yet that they continue to monitor such concerns so they can continue to address them. Teacher buy-in is critical for sustaining innovation and implementation (Hall & Hord, 2001) and by acknowledging and addressing feelings of discomfort and teacher concerns through professional development and support, change facilitators can better ensure sustainability of innovations (p. 279).

“The teacher is the gatekeeper of change in the classroom, and professional development designed to change teacher practice must be guided by and integrated with teachers’ existing values, valences, knowledge, and behaviors” (Giordano, 2007, p. 115). Professional

development must be meaningful and in-line with teacher values and beliefs. Throughout the entire professional development process, administrators should be constantly evaluating their programs to see if teacher needs are met, how they are responding, what concerns they have, and the programs should be adjusted. So often, professional development does not address teacher concerns, only addressing the district or state-level concerns. When teachers are forgotten, professional development becomes less effective.

CHAPTER III

RESEARCH DESIGN

This mixed-methods study included West Virginia teachers and administrators from two middle schools.

Teachers were given surveys that addressed the following: frequency of technology use for personal and professional use, confidence level with various technology programs/tools, the perceived engagement of students when technology is used by either the teacher or the students. Additional demographic information was collected within the survey including: age range, gender, years of teaching experience, if they are or are not a certified teacher, list of degrees earned (undergraduate and graduate), children living at home, computer and internet at home, technology professional development attended, and other technology learning experiences that has helped them learn the available technologies.

Following the surveys, all teacher participants were asked to voluntarily participate in a follow up interview regarding their perceived technology skills, available technologies in their school/classroom, ideas on past and future educational technology staff development, and perceived student engagement and learning with the use of technology. Additionally, principals and assistant principals were given a similar survey as teacher participants and were also asked to participate in follow up interviews.

The purpose of this study was to determine how middle school teachers and administrators perceive how students are engaged when technology is used in their classrooms. Additionally, teachers' perceptions of their own technology skills were studied to see if there was a relationship between their perceived technology skills and their attitude toward its effectiveness to engage middle school students. Teachers and administrators learning

experiences regarding technology was also addressed including how they learned to use available technologies, through professional development, university courses, or personal informal training.

Profiles of Context

State

In 2005, West Virginia became the second state in the nation to join the Partnership for 21st Century Skills (“P21”), an advocacy organization which was developed to define a 21st century vision of education to prepare students for the 21st century workforce. P21 is made up of members from the business community, education leaders, and policymakers. Through this partnership, a new initiative in West Virginia called Global 21 was developed to help teachers better implement technology, cooperation, collaboration, and other necessary 21st century skills into their content and classrooms.

Kids today need to know more and do more than ever before. That is why West Virginia is changing what teachers teach and how they teach from preschool to high school to improve learning. This change is fundamental and what we call Global21: Students deserve it. The world demands it. Global21 develops self-directed, motivated students who will be prepared for their future in an ever-changing world (West Virginia Department of Education, 2009).

West Virginia is leading the nation in the technology initiative in public schools, in addition to the Global21 program. A recent report, a joint project of *Education Week* and the Editorial Projects in Education Research Center, *Technology Counts 2008: STEM, The Push to Improve Science, Technology, Engineering and Mathematics*, showed West Virginia at the “top of its class for the use of technology.”

Professional development, especially as it relates to 21st century learning tools and skills has also become an initiative in the state. This has been addressed through the creation of the Teacher Leadership Institute. The institute allows counties to select county-teams or school-

teams to attend a weeklong workshop to learn more about how to teach and prepare students for the 21st century. Teachers in attendance receive a laptop to use during their tenure in the county and are taught throughout the week, strategies to use the technology and how to develop and implement Project Based Learning (PBLs) in their classroom upon their return. These week-long meetings are held in the summer and teachers are compensated for their attendance.

RTI (Response Through Intervention) is an initiative in the state that ensures that all students receive instruction to meet their diverse needs. Students who struggle with reading or math are given additional instruction and practice in these areas with their teacher while other students are allowed time to have their knowledge enriched and to further develop their skills. Schools in the state are being added to the RTI program gradually and will continue until all schools are participants.

County

The county in which this research study was completed has several initiatives. One such initiative is essential curriculum, vertical alignment, and chunking of standards. The County Leadership Team meets monthly to work on better organizing the state standards to meet the needs of teachers and students in the county. Teachers of various grade levels have spent time planning what each student should know and be able to do at the end of their time in each grade level. Additionally, they have combined standards when possible and reorganized them into themes which help teachers to teach the standards in an order that makes the most sense and allows for the greatest student understanding and retention.

Classroom management skill improvement is also an initiative in the county. APL Associates have been offering workshops in the county for many years that give teachers the strategies they need to keep students on task and participating in the classroom environment. These workshops are not mandated, but attendance is highly suggested for all teachers. These

are weeklong summer workshops that teach teachers how to do everything from using a “bell-ringer” at the beginning of class to get students on task from the first minute, to putting students “on the clock” to give them a specified amount of time to complete a task and keep them engaged.

Robert Marzano’s teaching strategies have been an initiative in the county for the past few years. All teachers in the county were given Marzano’s book of instructional strategies and have completed a quasi-book study over the past few years, with specific instructional strategies highlighted and focused on during professional development sessions that are held in the schools every couple of months.

Standards-based mathematics and technology use in mathematics has become more of a focus in this county over the past few years. Math teachers have developed a learning community that meets monthly at one of the middle schools to share ideas of projects they have implemented in their classrooms and to share technology resources. Additionally, the county along with a neighboring county, participated in Project METTS, a grant funded program that allowed math teachers within the county to improve their technology skills and standards-based teaching through attendance at monthly workshops and technology resources that were purchased through the grant.

Schools

School A. School A focuses their initiatives on interdisciplinary teaching and diversity. Each “team” of teachers, comprised of one math, science, social studies, reading, and language arts teacher, those that share the same students, develop a unit that is taught in all subject areas at the same time. For example, one team developed and implemented a Holocaust unit that was taught for a week and that was the only thing taught during the week in all five of the core

content classes. These units allow students to see how various subject areas are related to one another and how they are all important in the real world.

Diversity is another initiative at School A. Each interdisciplinary team of teachers is assigned a country to study. This is similar to the interdisciplinary units discussed above, but allows students the opportunity to learn more about a country and culture in the process. Students on each team present their findings to the other teams of students during key days throughout the school year.

School B. 21st century teaching is an initiative of School B. The school's goals include improving student achievement through the integration of technology and the implementations of 21st century learning skills, improving infrastructure of technology to support teacher and student use, and to ensure technology literacy among students. School B has a Technology Integration Specialist (TIS) on staff that is available to help teachers to plan and implement technology lessons in their classrooms.

Student improvement on standardized test scores, especially in math and reading is also an initiative at School B. Through test score analysis and a remediation program at the school, administrators and teachers are using data to drive this initiative and to help students be more successful on the state mandated tests. This improvement is especially important to the school in regard to the lower performing subgroups within the school.

The Case for Two Schools

Two schools in the same West Virginia county were selected for this research study. School size and available technologies are important to consider when looking at technology integration and student engagement with technology. These two schools were selected due to

their differences on many levels, including but not limited to school size, population (students and staff), and available technologies. Table 1 compares the two schools.

Table 1

School Comparisons: School A and School B

SCHOOL	# OF STUDENTS	# OF TEACHERS	AVERAGE CLASS SIZE	# OF COMPUTERS	COMPUTER: STUDENT RATIO	# OF PROJECTION DEVICES	# OF ELECTRONIC WHITE BOARDS	PROJECTOR: TEACHER RATIO	% LOW INCOME	% WHITE
School A	635	50	22.8	221	1:2.9	17	5	1:2.94	34.89	91.01
School B	1260	87	25.3	352	1:3.6	43	4	1:2.02	35.93	89.24

Sources: WV Five Year Strategic Plans 2009-2010, West Virginia Department of Education School Profiles

School A is nearly half the size of School B in regards to student population. Though School B has nearly twice as many students as School A, they do not have double the amount of technology available to the students and staff, especially as it relates to computers per student. School A has a computer-student ratio of 1:2.9 (School B has 1:3.6). School B actually has a higher projector-teacher ratio of 1:2.02 (School A has 1:2.94). Though School A has a higher computer-student ratio, School B has a higher projector-teacher ratio. School A has an average class size of 22.8 as compared to School B's average class size of 25.3. In many ways, particularly in regard to population and technology availability, there seems to be a significant difference between these two schools.

In regard to goals, as mentioned on the Five Year Strategic Plan of these two schools, both are in need of additional technologies to meet the needs of their students though School B feels a greater urgency in their need for available technologies. School B is struggling to update out-of-date technology and even put on their Five Year Strategic Plan that their number one goal in regard to a needs assessment for technology planning is to "continue replacing Windows 2000 computers with newer models." Additionally, School B stated that they need to continue

purchasing laptops so teachers could use them for class projects and in their rooms as well as write grants for mobile laptop computer labs. Lastly, School B stated that they need to “continue to increase the number of computers for student access to meet state guidelines.” School A simply stated that more technology needs to be acquired (through purchase or grant funding) for classrooms and an additional computer lab. School A also mentioned teacher training as a need/goal on their strategic plan.

Description of the Population

Teachers

The sample of educators included teachers from two middle schools within the same West Virginia county. All 127 teachers in each of the two schools, 50 teachers from School A and 87 from School B, were given a survey to assess their perceptions of their own technological skills as well as their perceptions of how engaged students are when using technology in the classroom. The sample includes all teachers who voluntarily participated by responding and turning in the survey. At School A, 16 teachers (32.00%) participated in the survey and at School B, 23 teachers (26.44%) participated.

Following the survey, all participating teachers, 39 total teachers from Schools A and B, were asked to participate in a follow-up interview to further discuss their perceptions of student engagement when technology is used in their classrooms, their perceptions of their own technology skills, as well as how they acquired those skills, either through professional development or through other learning experiences. Of the 39 total teacher participants who completed the survey, 11 total teachers (six from School A and five from School B) volunteered to participate in the follow-up interview.

Administrators

The sample of administrators included principals and assistant principals from each of two middle schools involved in the study within the West Virginia county. Each administrator, two principals, one from each school, and four assistant principals, one from School A and three from School B were given a survey to assess their perceptions of their own technological skills as well as their perceptions of how engaged students are when using technology in the classroom. Of the six administrators given the survey, three responded by turning in their survey responses, one from School A and two from School B.

Following the survey, all participating administrators, three total administrators from Schools A and B, were asked to participate in a follow-up interview to further discuss their perceptions of student engagement when technology is used in the classrooms in their school, their perceptions of their own technology skills, as well as how they acquired those skills, either through professional development or through other learning experiences. Of the three total administrator participants who completed the survey, all three administrators (one from School A and two from School B) volunteered to participate in the follow-up interview.

Selection of Participants

Prior to asking for participation at each of the two middle schools, letters of agreement were secured from the county superintendent as well as the principals of each of the two participating schools. Teachers were assigned a letter of the alphabet to represent the school they work in and a number to differentiate them from other educators and to maintain confidentiality during the study. All teachers and administrators at the two middle schools in the West Virginia county were asked to participate in the study by completing the survey. Each teacher and administrator who participated by turning in the survey are included in the sample of participants for this study. School A had 16 teacher participants and one administrator participant and School

B had 23 teachers and two administrators to complete the survey. Each teacher and administrator was asked to volunteer to participate in follow-up interviews after the surveys. School A had 6 teachers and one administrator volunteer to be interviewed and School B had 5 teachers and two administrators that participated in the follow-up interview.

Data Collection and Analysis

IRB approval (H-22185) was granted and all research data was collected during the Spring semester of 2010. The researcher's IRB ethics tests were up-to-date at the time of the data collection and analysis.

Instruments

Survey. The survey used in this study was a researcher-created instrument that had not yet been validated. It was developed based on the literature referenced in this document. The first page of the survey instrument was used merely to collect demographic information on each respondent in order to look for similarities, to make comparisons, and to draw conclusions.

The second page of the survey instrument asked teachers to complete a Likert scale, showing their perceptions of student engagement with different types of technology, both as teacher tools and as student tools. "Digital technology and online experiences have already profoundly affected the minds of young people today. Research is now confirming that the interactive visual & auditory presentation of info kids experience in the digital world is actually rewiring their brains" (McCain, 2008, p. 13). What engages students now is not the same as 50, 25, or even five years ago. Incorporating this technology and visual kinesthetic material and teaching methods into the classroom is one way to reach these 21st Century learners (Clem & Simpson, 2008). Learner-controlled technology such as computers, the Internet, and video games make learning fun in ways that schools struggle to (Senge et. al, 2000, p. 51). Students

are engaged and learn in different ways. This page of the survey instrument was to address how teachers perceive the differences in student engagement with the various listed technologies.

Teacher and administrator confidence with technology was addressed on the third page of the survey instrument. Participants were asked to rank their confidence with using listed technologies for both personal and professional use. Becker (2000) states that computers serve as a 'valuable and well-functioning instructional tool' (p.29) in schools and classrooms in which teachers are adequately prepared. The United States Department of Education (2003) states that a majority of teachers (85%) reported feeling "somewhat well-prepared" to use technology in their instruction and in 2000, the National Center for Education Statistics found that 53% felt somewhat prepared. In describing their Perceptual Control Theory, Zhao & Cziko (2001) summarize the following necessities for teachers to want to integrate technology into their class: they must believe that technology can help them achieve higher goals more effectively and that they have adequate ability and resources to use the technology, they must feel confident that using such technology will help them better reach the needs of their students, and they must believe that they will have sufficient ability and resources to use the technology. Educator confidence with technology is key to its implementation in the classroom. This page of the survey was to address teacher and administrator confidence with listed technologies.

Professional development and learning opportunities was addressed on the final page of the survey instrument. Teachers and administrators were asked open-ended questions regarding how they have learned to use technology, both formally and informally. In order to help more teachers use technology in their teaching, educational institutions at all levels have begun to invest in providing sufficient professional development opportunities for teachers to develop technical skills while enhancing access to technological resources (Zhao & Cziko, 2001, p. 10). "The pace of technological evolution today makes it increasingly difficult for the classroom

teacher to keep up with it. Given all the duties they must attend to, little time remains to explore the options that all the various new technologies might offer” (Teacher Training and Classroom Technology Integration, 2008). Staff development, time set aside for teachers to learn new technology is essential in order for teachers to even consider implementing it into their classrooms. Teacher perceptions of their learning experiences with technology were addressed on the final page of the survey instrument.

The survey (Appendix A) was given to all 127 teachers, 50 from School A and 87 from School B, at the two schools in the West Virginia county. They were offered the opportunity to complete said survey on the given paper copy or to complete it online. The online survey was developed using WVU’s SimpleForms website. The survey had questions regarding demographic information (age range, gender, years of teaching experience, if they are or are not a certified teacher, degrees earned, children living at home, computer and internet at home, technology professional development attended, and other technology learning experiences that has helped them learn the available technologies.). The survey also included a Likert scale asking about their confidence when using different types of technology as well as another Likert scale asking about perceptions of student engagement when specific technologies are included in their classroom. In addition, the survey asked if teachers felt students were engaged when technology is used in their classroom. Finally, there were open-ended questions that asked about staff development opportunities that teachers have had or would like to have the opportunity to participate in to advance their technology ability/confidence. Of the 127 teachers given the survey, 39 responded by turning in their survey answers, 16 from School A and 23 from School B. A similar survey was given to administrators (Appendix B). Of the five administrators given the survey, three responded.

The survey results offered a vast amount of quantitative data from the Likert scale and demographic information as well as qualitative data from the open-ended questions at the end of the survey. This allowed the researcher to identify trends from the quantitative data and themes from the qualitative data.

Interviews. Of the teachers and administrators who participated in the survey, 39 teachers and three administrators were asked to volunteer to participate in follow-up interviews in order to attain more information regarding their perceptions of student engagement when technology is used. Of the 39 teacher participants in the survey, 11 volunteered for the follow-up interview. Of the three administrator participants in the survey, all three volunteered for the follow-up interview. These volunteer participants were asked questions (Appendix C) that addressed why they use or why they hesitate to use such technologies in their classroom on a regular basis. The interviews were tape recorded and transcribed. Administrator interview questions (Appendix D) varied slightly from the teacher interview questions and addressed why they believe the teachers in their school use or hesitate to use such technologies in their classroom on a regular basis.

All surveys were collected and analyzed looking for trends in the quantitative data. Interviews were audio taped and transcribed in order to analyze and look for themes to emerge from the qualitative data. Observed trends and themes are documented in chapter four of this document. Additionally, survey results and interviews were cross-referenced to see what common traits emerged between teachers' perceived technology abilities and their perceptions of student engagement when technology is used. Quantitative results are given in frequency and mean distributions and can be found in chapter four.

Limitations

Selecting two of five possible middle schools in this West Virginia county is a limitation. Having a larger sample of more teachers and administrators from all possible schools in the district would have offered a greater comparison. A limited sample of two schools was selected as a case study project, one school from each end of spectrum regarding population and technology availability.

Focusing the study on the middle school level, including only middle school teachers and administrators instead of teachers and administrators of all grade levels, limited my results. Including primary, intermediate, and high school teachers in the study would have offered a more diverse sample.

The researcher is a teacher in and resident of the West Virginia county where the study was completed, though a teacher at a different school than School A or B. This could have led to interviewer bias or some participants may have felt more encouraged to participate in the study due to relationships that they have with the researcher, including personal/professional relationships.

Using a researcher-created survey limited the validity and integrity of the results. There was not an instrument suitable that met the needs of the survey, so the researcher developed one. It has not been validated. Running a statistical integrity and validating the instrument is a recommendation for future research.

The weather impacted the data collection and could have limited the number of responses that were received. In the midst of the data collection, the West Virginia county in which data was collected was hit by two back-to-back large winter storms, dumping a total of five feet of snow on the area. Schools in this county were not in session for nearly two weeks. Teachers and administrators may have forgotten to turn in the surveys or misplaced them during this time.

Once they returned back to the school building, the immediate importance was to get their students caught up on what had been missed during the time off and missed instructional time. This research was likely their last concern, limiting the number of responses to the survey.

CHAPTER IV

RESULTS AND DISCUSSION

This study explored teacher and administrator perceptions of technology use within the two selected West Virginia middle schools. The research questions that guided this study were:

1. What is the perception of how students are engaged with technology?
 - a. Teacher perceptions?
 - b. Administrator perceptions?
2. How does the perception of one's own technology skills relate to one's perception of how students are engaged with technology?
 - a. Teacher perceptions?
 - b. Administrator perceptions?
3. How does an administrator's perception of their teachers' technology skills relate to the teachers' perceptions of how teachers are engaged with technology?
4. What are perceived as facilitators and/or barriers to using technology?
 - a. Teacher perceptions?
 - b. Administrator perceptions?
5. What trainings/learning experiences have been helpful in helping both teachers and administrators learn to use available technologies?
 - a. What professional development have teachers and administrators attended that has helped them to learn to use available technologies?
 - b. What additional learning experiences, professional and personal, have teachers and administrators had that has helped them to learn to use available technologies?

A total of 42 respondents, 39 teachers and three administrators, participated in this study. Sixteen teachers and one administrator from School A and 23 teachers and two administrators from School B began their participation in the study by completing the research survey. Once surveys had been returned, all 42 respondents were invited to participate in one-on-one

interviews. Of the 42, 14 volunteered to participate in the follow-up interviews, six teachers and one administrator from School A and five teachers and two administrators from School B. The information below offers a glimpse at the data from both the surveys and interviews. All data was collected and analyzed through quantitative and qualitative means to look for trends and themes to emerge.

Demographic Information

School A

Teachers. Of the 50 teachers asked to complete the survey, 16 teachers responded, 14 by completing the paper/pencil survey and two (Participants A15 and A16) by completing the survey online, using the researcher-created SimpleForms survey instrument. Demographic information from School A teachers can be found in Table 2.

Table 2

Demographic Data- School A Teachers

SCHOOL CODE PARTICIPANT CODE	AGE RANGE	GENDER	YEARS OF TEACHING EXPERIENCE	SUBJECT(S) TAUGHT	CERTIFIED?	GRADUATE DEGREE EARNED?
A1	26-35	FEMALE	6-10	SOCIAL STUDIES	YES	YES
A2	55 AND ABOVE	FEMALE	26 AND ABOVE	MATH	YES	NO
A3	26-35	FEMALE	6-10	FRENCH	YES	YES
A4	26-35	MALE	6-10	READING/LANGUAGE ARTS	YES	YES
A5	36-45	MALE	16-20	SOCIALSTUDIES	YES	NO
A6	25 AND BELOW	FEMALE	5 AND BELOW	MUSIC	YES	NO
A7	25 AND BELOW	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	YES	NO
A8	55 AND ABOVE	FEMALE	26 AND ABOVE	PHYSICAL EDUCATION/HEALTH	YES	YES
A9	36-45	FEMALE	21-25	MATH	YES	NO
A10	46-55	MALE	26 AND ABOVE	SOCIAL STUDIES	YES	YES
A11	26-35	MALE	5 AND BELOW	MATH	YES	NO
A12	46-55	FEMALE	5 AND BELOW	SPECIAL EDUCATION	NO	NO
A13	26-35	FEMALE	6-10	SPECIAL EDUCATION	YES	YES
A14	36-45	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	YES	YES
A15*	26-35	FEMALE	6-10	SPANISH	YES	YES
A16*	46-55	FEMALE	6-10	SPECIAL EDUCATION/READING	YES	YES

*These participants responded with the online survey in lieu of the paper/pencil survey.

Of the 16 respondents, 12 (75.00%) were female and 4 (25.00%) were male. Half (50.00%) of the teachers were age 35 or below, more specifically, 6 (37.50%) were aged 26-35 and 2 (12.50%) were aged 25 or below. The other half of the teachers were 36 and above in age with three (18.75%) aged 36-45, three (18.75%) aged 46-55, and two (12.50%) over 55 years in age. Eleven out of the 16 respondents (68.75%) had been teaching less than 10 years at the time of the survey, five (31.25%) with less than 5 years of teaching experience and six (37.50%) with between six and 10 years of teaching experience. The remaining five teachers (31.25%) have been teaching for 16 or more years, with three of those five (18.75% of the total) having 26 years or more of teaching experience.

As for the content breakdown of how many respondents teach each subject, it is important to note that at School A, that there were no science teachers that responded to the survey. Science and technology are interconnected and there is a great expectation that science teachers will incorporate technology into their classrooms. The greatest number of respondents came from Math (18.75%), Social Studies (18.75%), and Language Arts/Reading (18.75%) teachers. Two foreign Language Teachers, one Spanish teacher and one French teacher, made up 12.50% of the respondents as did Special Education teachers. The remaining 18.75% of teachers included one Unified Arts teacher, one Physical Education teacher, and one teacher of more than one subject (Special Education/Read 180).

Additional demographic information collected from School A teachers included that 15 (93.75%) of the 16 teachers are certified with only one (6.25%) not certified. Nine (56.25%) of the 16 respondents have earned graduate degrees, with the other seven (43.75%) having only earned undergraduate degrees. Seven out of 15 (one person did not respond to this question), 46.67%, do have children living at home. When asked on the survey if they had a computer and

internet at home, 100.00% of teacher respondents from School A stated that they did have both computer and internet in their homes.

Administrators. School A's administrator respondent, Participant A17, was the only administrator who responded to the survey.

School B

Teachers. Of the 87 teachers asked to complete the survey, 23 teachers responded, 22 by completing the paper/pencil survey and one (Participant B23) by completing the survey online using the researcher-created SimpleForms survey instrument. Table 3 summarizes the demographic data for School B teachers.

Of the 23 respondents, 15 (65.22%) were female and eight (34.78%) were male. Over half (52.17%) of the teachers were age 46 and above, with nine (39.13%) aged 46 to 55 and three (13.04%) aged 56 and above. The approximately other half (47.83%) of respondents were aged 45 or below, 13.04% aged 36-45, 30.43% aged 26-35, and the final 4.35% below 25 years of age. The largest number of respondents from School B had between six and 15 years of experience (30.43% with 6-10 years and 21.74% with 11-15 years), or greater than 26 years of teaching experience (26.09% of respondents). Only two (8.70%) out of the 23 that responded, stated that they had less than five years of teaching experience, only one (4.35%) had between 16 and 20 years of teaching experience, and two (8.70%) had 21-25 years of experience.

As for the content breakdown of how many respondents teach each subject, it is important to note that at School B, there were respondents from every content area. The greatest number of respondents came from Social Studies (21.74%) and Language Arts/Reading (17.40%) teachers. Math, Science, Special Education, and teachers that teach more than one subject each represented 8.70% of respondents. Unified Arts and Physical Education/Health each had one respondent (4.35%). Three respondents marked "Other" (with one marking "Plato

Lab/Remediation” and the other two not marking what “other” was for them) and one participant marked “None” for subject taught.

Table 3

Demographic Data- School B Teachers

SCHOOL CODE PARTICIPANT CODE	AGE RANGE	GENDER	YEARS OF TEACHING EXPERIENCE	SUBJECT(S) TAUGHT	CERTIFIED?	GRADUATE DEGREE EARNED?
B1	46-55	FEMALE	26 AND ABOVE	UNIFIED ARTS	YES	YES
B2	36-45	MALE	11-15	PHYSICAL EDUCATION/HEALTH	YES	YES
B3	46-55	FEMALE	6-10	SPECIAL EDUCATION/SOCIAL STUDIES	NO	NO
B4	26-35	FEMALE	6-10	READING/LANGUAGE ARTS	YES	NO
B5	25 AND BELOW	MALE	5 AND BELOW	READING/LANGUAGE ARTS	YES	NO
B6	26-35	FEMALE	11-15	MATH/READING/SPANISH	YES	NO
B7	26-35	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	YES	NO
B8	55 AND ABOVE	FEMALE	11-15	PLATO LAB (REMEDIATION)	YES	NO
B9	55 AND ABOVE	FEMALE	26 AND ABOVE	NONE MARKED	YES	YES
B10	46-55	FEMALE	26 AND ABOVE	MATH	YES	YES
B11	36-45	MALE	11-15	SCIENCE	YES	YES
B12	55 AND ABOVE	FEMALE	26 AND ABOVE	SOCIAL STUDIES	YES	NO
B13	46-55	FEMALE	26 AND ABOVE	OTHER (NONE LISTED)	YES	YES
B14	26-35	FEMALE	6-10	SCIENCE	YES	YES
B15	36-45	FEMALE	11-15	MATH	YES	YES
B16	26-35	MALE	6-10	OTHER (NONE LISTED)	YES	NO
B17	46-55	FEMALE	21-25	SOCIAL STUDIES	YES	NO
B18	26-35	MALE	6-10	SOCIAL STUDIES	YES	YES
B19	46-55	MALE	21-25	SOCIAL STUDIES	YES	YES
B20	26-35	FEMALE	6-10	READING/LANGUAGE ARTS	YES	YES
B21	46-55	FEMALE	6-10	SPECIAL EDUCATION	NO	NO
B22	46-55	MALE	16-20	SPECIAL EDUCATION	YES	YES
B23*	46-55	MALE	26 AND ABOVE	SOCIAL STUDIES	YES	YES

*These participants responded with the online survey in lieu of the paper/pencil survey.

Additional demographic information collected from School B teachers included 21 (91.30%) of teachers are certified with only one (8.70%) not certified. Thirteen of the 23 respondents (56.52%) have earned graduate degrees, with the other 10 (43.48%) having only earned undergraduate degrees. Thirteen out of 23 (56.52%) do have children living at home. When asked on the survey if they had a computer and internet at home, 100.00% of respondents stated that they do have a computer at home, but only 95.65% stated that they had internet at home.

Administrators. School B had two administrator participants, participants B24 and B25.

Survey Results

School A and School B

Perceptions of how students are engaged with technology. The first research question for this study is “What is the perception of how students are engaged with technology?” Within the survey instrument, teachers and administrators were asked to rate their perception of the level of student engagement when specific technologies are used in the classroom by the teacher as pedagogical tools or by the student as learning tools. Participants were asked to state whether they felt that students were Very Engaged, Somewhat Engaged, Not at All Engaged, or N/A.

Teachers. The combined results for School A and School B teachers are found in Table 4. Teachers results from School A and School B showed that most of the technologies listed increased in level of Very Engaged from teacher use as pedagogical tools to student use as learning tools. Figure 1 shows the change between teacher use and student use in perceptions of students being “Very Engaged” for teachers from School A and School B.

Table 4

*Level of Student Engagement when Teachers and Students Use Technology in the Classroom-
School A and B Teacher Results*

Technology	n	Perception of Student Engagement when Technologies are Used as Pedagogical Tools BY THE TEACHER				Perception of Student Engagement when Technologies are Used as Learning Tools BY THE STUDENT				
		Very engaged	Somewha t engaged	Not at all engaged	N/A	Very engaged	Somewha t engaged	Not at all engaged	N/A	N
Internet Explorer (or other internet web browser)	38	26.32%	63.16%	2.63%	7.89%	60.53%	26.32%		13.16%	38
Microsoft Word (or other word processing program)	37	11.11%	69.44%	11.11%	8.33%	27.78%	55.56%		16.67%	36
Microsoft Excel (or other spreadsheet program)	36	2.78%	33.33%	8.33%	55.56%	14.29%	20.00%	2.86%	62.86%	35
Microsoft PowerPoint (or other presentation program)	38	44.74%	44.74%		10.53%	64.86%	13.51%	2.70%	18.92%	37
Microsoft Publisher (or other publishing program)	36	2.78%	27.78%	5.56%	63.89%	25.00%	8.33%		66.67%	36
Windows Movie Maker (or other movie editing program)	36	25.00%	8.33%	5.56%	61.11%	23.53%	5.88%	2.94%	67.65%	34
Google (or other internet search engine)	37	24.32%	51.35%	2.70%	21.62%	43.24%	40.54%		16.22%	37
Digital camera	35	14.29%	22.86%		62.86%	23.53%	14.71%		61.76%	34
Flip camera (or other digital video camera)	36	19.44%	13.89%	2.78%	63.89%	23.53%	11.76%		64.71%	34
LCD Projector	36	33.33%	47.22%	2.78%	16.67%	33.33%	22.22%	2.78%	41.67%	36
Elmo (or other document presenter)	37	21.62%	29.73%		48.65%	19.44%	25.00%		55.56%	36
Interactive whiteboard	36	27.78%	19.44%		52.78%	27.78%	11.11%	2.78%	58.33%	36
Wireless slate	36	22.22%	2.78%		75.00%	19.44%	2.78%		77.78%	36
Student response systems	36	22.22%	11.11%		66.67%	27.78%	5.56%		66.67%	36
iPod (or other MP3 player)	37	24.32%	13.51%		62.16%	22.22%	11.11%		66.67%	36

The technologies showing the greatest increase in “very engaged” from teacher to student use included Internet Explorer which showed a 34.21% point increase, Microsoft Publisher which had an increase of 22.22% points, Microsoft PowerPoint which increased by 20.12% points, Google which increased by 18.92% points, and Microsoft Word which increased by 16.67% points. The only exceptions to this noted increase were Windows Movie Maker, Elmo,

Wireless Slate, and iPod which dropped from teacher use to student use, Movie Maker dropping 1.47% points, Elmo dropping 2.18% points, Wireless Slate dropped 2.78% points and iPod dropped 2.10% points. The LCD Projector and Interactive Whiteboard did not show any increase or decrease in perceived engagement (“Very Engaged”) from teacher use as pedagogical tools to student use as learning tools.

Figure 1

*Level of Student Engagement “Very Engaged” - Teacher Use vs. Student Use
School A and School B Results*

Also worth mentioning are the N/A responses to the listed technologies within the survey. Three teachers, two at School A and one at School B, marked N/A for all listed technologies for both teacher use and student use. Including these two teachers, the amount of N/A responses

was quite surprising. Figure 2 shows the number of N/A responses for teacher and student uses of the listed technologies. Nine of the 15 listed technologies had greater than 50% of respondents choose N/A for teacher use as a pedagogical tool and ten technologies had greater than 50% choose N/A for student use as a learning tool. These technologies include: Microsoft Excel, Microsoft Publisher, Windows Movie Maker, Digital camera, Flip video camera, Elmo (student use only), Interactive Whiteboard, Wireless Slate, Student Response Systems, and iPod.

Figure 2

*Level of Student Engagement “N/A” - Teacher Use vs. Student Use
School A and School B Results*

For the survey question, “Overall, would you say that students are more engaged when technology is used in the classroom?” 35 out of 37 (94.59%) of teachers who responded to this

question said “Yes,” only one said “No” and one, though it was not an option on the survey, wrote in “Unsure.”

Figure 3

*“Do you feel that students are more engaged when technology is used in the classroom?”
School A and School B Teacher Results*

Administrators. Three administrators, one from School A and two from School B, responded to the survey that was given to them. The table below (Table 5) shows the administrator perceptions.

Table 5

*Level of Student Engagement when Teachers and Students Use Technology in the Classroom-
School A and School B Administrator Results*

Technology	n	Perception of Student Engagement when Technologies are Used as Pedagogical Tools BY THE TEACHER				Perception of Student Engagement when Technologies are Used as Learning Tools BY THE STUDENT				N
		Very engaged	Somewha t engaged	Not at all engaged	N/A	Very engaged	Somewha t engaged	Not at all engaged	N/A	
Internet Explorer (or other internet web browser)	3	33.33%	66.67%			33.33%	66.67%			3
Microsoft Word (or other word processing program)	3		100.00%				100.00%			3
Microsoft Excel (or other spreadsheet program)	2		100.00%				100.00%			2
Microsoft PowerPoint (or other presentation program)	3	66.67%	33.33%			66.67%	33.33%			3
Microsoft Publisher (or other publishing program)	3		100.00%			33.33%	66.67%			3
Windows Movie Maker (or other movie editing program)	2	50.00%			50.00%	66.67%			33.33%	3
Google (or other internet search engine)	3	66.67%	33.33%			33.33%	66.67%			3
Digital camera	3	66.67%	33.33%			66.67%	33.33%			3
Flip camera (or other digital video camera)	3	66.67%	33.33%			100.00%				3
LCD Projector	3	33.33%	66.67%				100.00%			3
Elmo (or other document presenter)	3	33.33%	66.67%				100.00%			3
Interactive whiteboard	3	100.00%				100.00%				3
Wireless slate	3	66.67%	33.33%			33.33%	33.33%	33.33%		3
Student response systems	3	66.67%			33.33%	66.67%			33.33%	3
iPod (or other MP3 player)	2	50.00%			50.00%	50.00%			50.00%	2

For the survey question, “Overall, would you say that students are more engaged when technology is used in the classroom?” the administrators from both School A (Participant A17) and School B (Participants B25 and B26) said “Yes.” One administrator stated as her reasoning that “Outside of the school, students use technology ALL of the time. They are used to that

mode of communication- that is the “NORM” for them. Teachers need to use the mode of communication that students relate to best.”

Figure 4

“Do you feel that students are more engaged when technology is used in the classroom?” - School A and School B Administrator Results

Relationship between the perceptions of one’s own technology skills and the perception of how students are engaged with technology. The second research question, “How does the perception of one’s own technology skills relate to one’s perception of how students are engaged with technology?” looks at both teacher and administrator perceptions of their own technology skills and their perception of how students are engaged with technology. Teacher and administrator perceived confidence with using the listed technologies for personal and professional uses were addressed within the survey instrument.

Teachers. In looking at Table 6, one notices the difference in confidence with the different types of technologies. For example, the basics: computer, email, Internet Explorer,

Microsoft Word, and Google, all have above 90% of respondents feeling “Very Confident” for personal use and only slightly lower percentages for professional use for these technologies.

Table 6

*Level of Confidence when Teachers Use Technology Tools/Programs
School A and School B Teacher Results*

Technology		PERSONAL USE				PROFESSIONAL USE				
		Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	
Computer	39	92.31%	7.69%			87.18%	12.82%			39
Email	39	97.44%	2.56%			94.87%	5.13%			39
Internet Explorer (or other internet web browser)	38	97.37%	2.63%			97.37%	2.63%			38
Microsoft Word (or other word processing program)	39	97.37%	2.63%			94.74%	5.26%			38
Microsoft Excel (or other spreadsheet program)	39	33.33%	41.03%	25.64%		35.90%	28.21%	35.90%		39
Microsoft PowerPoint (or other presentation program)	39	69.23%	25.64%	5.13%		66.67%	25.64%	7.69%		39
Microsoft Publisher (or other publishing program)	38	18.42%	39.47%	42.11%		18.42%	31.58%	47.37%	2.63%	38
Windows Movie Maker (or other movie editing program)	39	20.51%	28.21%	51.28%		20.51%	30.77%	46.15%	2.56%	39
Google (or other internet search engine)	39	97.44%	2.56%			97.44%	2.56%			39
Digital camera	39	69.23%	28.21%	2.56%		56.41%	30.77%	7.69%	5.13%	39
Flip camera (or other digital video camera)	38	44.74%	26.32%	28.95%		37.84%	27.03%	29.73%	5.41%	37
LCD Projector	36	69.44%	16.67%	11.11%	2.78%	69.44%	22.22%	8.33%		36
Elmo (or other document presenter)	37	37.84%	18.92%	37.84%	5.41%	37.84%	18.92%	37.84%	5.41%	37
Interactive whiteboard	38	10.53%	39.47%	50.00%		13.16%	34.21%	50.00%	2.63%	38
Wireless slate	37	10.81%	18.92%	67.57%	2.70%	13.51%	16.22%	67.57%	2.70%	37
Student response systems	38	18.42%	21.05%	57.89%	2.63%	18.42%	15.79%	63.16%	2.63%	38
iPod (or other MP3 player)	38	60.53%	31.58%	7.89%		47.37%	26.32%	23.68%	2.63%	38
Text Messaging (via cell phone)	39	69.23%	17.95%	12.82%		46.15%	17.95%	28.21%	7.69%	39

Other Microsoft programs such as PowerPoint, Excel, and Publisher vary from 18.42% for Publisher to 69.23% for PowerPoint for personal use, with confidence scores even lower for

professional use. Less than 20% of respondents felt “Very Confident” in using Microsoft Publisher, Interactive Whiteboards, Wireless slates, and Student Response Systems (clickers) either for personal or professional use.

Figure 5

*Level of Teacher Confidence- “Very Confident”- Personal Use vs. Professional Use
School A and School B Teacher Results*

When comparing confidence levels for personal and professional use, there was a slight difference for most technologies listed between personal and professional use. Figure 5 shows the results of this comparison. For most of the technologies listed on the survey instrument, it

appeared that if a participant was confident with it for personal use, that they were either equally confident or only slightly less confident for professional use. Three of the technologies listed, Microsoft Excel, interactive whiteboards, and wireless slates showed an increase in confidence for professional use as compared to personal use. Eight of the 18 technologies showed a decrease in confidence from personal use to professional use and the other eight listed technologies stayed the same level of confidence for personal use as compared to professional use.

In attempting to compare teacher confidence levels with their perceptions of student engagement, it was imperative that a system be developed to rank teachers based on their responses to the confidence questions on the survey. Teacher respondents were given two points for every technology they listed as feeling “Very Confident,” were given one point for each technology listed as “Somewhat Confident,” and zero points for those listed as “Not at all Confident.” Once the scores were totaled for personal and professional use for each participant, their score was divided by the possible 38 points that they could have earned in order to get a percentage score. Teacher and administrator respondents scoring a 50% or higher for both personal and professional use are considered to be “tech confident” were grouped together in order to look for a relationship between confidence and perceptions of student engagement. Table 7 shows the demographic information along with the confidence levels, personal and professional, for each teacher participant from School A and School B.

Table 7

*Demographic Information Including Technology Confidence Levels
School A and School B Teacher Results*

SCHOOL CODE PARTICIPANT CODE	AGE RANGE	GENDER	YEARS OF TEACHING EXPERIENCE	SUBJECT(S) TAUGHT	Technology Confidence Level for Personal Use	Technology Confidence Level for Professional Use
A1	26-35	FEMALE	6-10	SOCIAL STUDIES	89.47%	89.47%
A2	55 AND ABOVE	FEMALE	26 AND ABOVE	MATH	36.84%	31.58%
A3	26-35	FEMALE	6-10	FRENCH	94.74%	94.74%
A4	26-35	MALE	6-10	READING/LANGUAGE ARTS	76.32%	68.42%
A5	36-45	MALE	16-20	SOCIALSTUDIES	47.37%	47.37%
A6	25 AND BELOW	FEMALE	5 AND BELOW	MUSIC	60.71%	57.89%
A7	25 AND BELOW	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	76.32%	42.11%
A8	55 AND ABOVE	FEMALE	26 AND ABOVE	PHYSICAL EDUCATION/HEALTH	47.37%	47.37%
A9	36-45	FEMALE	21-25	MATH	47.37%	44.74%
A10	46-55	MALE	26 AND ABOVE	SOCIAL STUDIES	44.74%	44.74%
A11	26-35	MALE	5 AND BELOW	MATH	65.79%	63.16%
A12	46-55	FEMALE	5 AND BELOW	SPECIAL EDUCATION	47.37%	44.74%
A13	26-35	FEMALE	6-10	SPECIAL EDUCATION	44.74%	36.84%
A14	36-45	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	65.79%	50.00%
A15	26-35	FEMALE	6-10	SPANISH	100.00%	97.36%
A16	46-55	FEMALE	6-10	SPECIAL EDUCATION/READING	86.84%	86.84%
B1	46-55	FEMALE	26 AND ABOVE	UNIFIED ARTS	57.89%	50.00%
B2	36-45	MALE	11-15	PHYSICAL EDUCATION/HEALTH	68.42%	68.42%
B3	46-55	FEMALE	6-10	SPECIAL EDUCATION/SOCIAL STUDIES	55.26%	55.26%
B4	26-35	FEMALE	6-10	READING/LANGUAGE ARTS	65.79%	52.63%
B5	25 AND BELOW	MALE	5 AND BELOW	READING/LANGUAGE ARTS	63.16%	63.16%
B6	26-35	FEMALE	11-15	MATH/READING/SPANISH	84.21%	65.79%
B7	26-35	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	65.79%	50.00%
B8	55 AND ABOVE	FEMALE	11-15	PLATO LAB (REMEDIATION)	47.37%	47.37%
B9	55 AND ABOVE	FEMALE	26 AND ABOVE	NONE MARKED	47.37%	47.37%
B10	46-55	FEMALE	26 AND ABOVE	MATH	73.68%	71.05%
B11	36-45	MALE	11-15	SCIENCE	84.21%	76.32%
B12	55 AND ABOVE	FEMALE	26 AND ABOVE	SOCIAL STUDIES	34.21%	31.58%
B13	46-55	FEMALE	26 AND ABOVE	OTHER (NONE LISTED)	94.74%	94.74%

B14	26-35	FEMALE	6-10	SCIENCE	42.11%	36.84%
B15	36-45	FEMALE	11-15	MATH	63.16%	47.37%
B16	26-35	MALE	6-10	OTHER (NONE LISTED)	57.89%	57.89%
B17	46-55	FEMALE	21-25	SOCIAL STUDIES	47.37%	47.37%
B18	26-35	MALE	6-10	SOCIAL STUDIES	73.68%	63.16%
B19	46-55	MALE	21-25	SOCIAL STUDIES	57.89%	57.89%
B20	26-35	FEMALE	6-10	READING/LANGUAGE ARTS	84.21%	84.21%
B21	46-55	FEMALE	6-10	SPECIAL EDUCATION	52.63%	52.63%
B22	46-55	MALE	16-20	SPECIAL EDUCATION	89.47%	89.47%
B23	46-55	MALE	26 AND ABOVE	SOCIAL STUDIES	94.74%	100.00%

Participants shaded in gray above are deemed to be “tech confident” for due to their confidence level scores being higher than 50.00%.

In Table 7, teacher confidence levels for using technology for personal and professional uses are listed along with the demographic information on each participant. In looking at those that are deemed for this research to be “tech confident,” out of the 39 teachers at School A and School B who responded to the survey, 23 (58.97%) are “tech confident.”

Administrators. Participant A17, administrator from School A was found to be “tech confident” due to her survey responses, scoring an 89.47% for personal use and an 86.84% for professional use. One of the two administrator respondents from School B was also found to be “tech confident.” Participant B25 scored a 57.89% for both personal and professional “tech confidence” and Participant B26 scored a 31.58% for both personal and professional “tech confidence.”

Table 8

*Level of Confidence When Administrators Use Technology Tools/Programs
School A and School B Administrator Results*

Technology	n	PERSONAL USE				PROFESSIONAL USE				N
		Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	
Computer	3	66.67%	33.33%			66.67%	33.33%			3
Email	3	100.00%				100.00%				3
Internet Explorer (or other internet web browser)	3	66.67%	33.33%			66.67%	33.33%			3
Microsoft Word (or other word processing program)	3	66.67%	33.33%			66.67%	33.33%			3
Microsoft Excel (or other spreadsheet program)	3	33.33%	66.67%			33.33%	66.67%			3
Microsoft PowerPoint (or other presentation program)	3	33.33%	66.67%			33.33%	66.67%			3
Microsoft Publisher (or other publishing program)	3	33.33%		66.67%		33.33%		66.67%		3
Windows Movie Maker (or other movie editing program)	3		33.33%	66.67%			33.33%	66.67%		3
Google (or other internet search engine)	3	33.33%	66.67%			33.33%	66.67%			3
Digital camera	3	66.67%	33.33%			66.67%	33.33%			3
Flip camera (or other digital video camera)	3		66.67%	33.33%			66.67%	33.33%		3
LCD Projector	3	66.67%	33.33%			66.67%	33.33%			3
Elmo (or other document presenter)	3	33.33%	66.67%			33.33%	66.67%			3
Interactive whiteboard	3	33.33%	33.33%	33.33%			66.67%	33.33%		3
Wireless slate	3		100.00%				100.00%			3
Student response systems	3	33.33%		66.67%		33.33%		66.67%		3
iPod (or other MP3 player)	3	33.33%	33.33%	33.33%		33.33%	33.33%	33.33%		3
Text Messaging (via cell phone)	3	33.33%	33.33%	33.33%		33.33%	33.33%	33.33%		3

Relationship between administrator perceptions of teachers' technology skills and teachers' perceptions of how students are engaged with technology. Of the teachers in School A and School B, 94.59% believed that students are more engaged when technology is

used in the classroom. The other 5.72% was divided between 2.86% that said no they are not more engaged and 2.86% who were “unsure.” The administrator perceptions of the teachers’ technology skills were addressed during the follow-up interview and therefore will be discussed later in chapter 4 of this document.

School A

Perceptions of how students are engaged with technology. The first research question for this study is “What is the perception of how students are engaged with technology?” Within in the survey instrument, teachers and administrators were asked to rate their perception of the level of student engagement when specific technologies are used in the classroom by the teacher as pedagogical tools or by the student as learning tools. Participants were asked to state whether they felt that students were Very Engaged, Somewhat Engaged, Not at All Engaged, or N/A.

Teachers. The results for School A teachers are found in Table 9. Teachers from School A stated on the survey that nearly all of the technologies listed increased in level of Very Engaged from teacher use as pedagogical tools to student use as learning tools. Figure 1 shows the change between teacher use and student use in perceptions of students being “Very Engaged.”

The technologies showing the greatest increase in perceived engagement from teacher to student use included Internet Explorer which showed a 33.33% point increase, Microsoft Word which increased by 20.00% points, Microsoft PowerPoint which increased by 15.83% points, and Google which increased by 13.33% points. The only exceptions to this noted increase were Windows Movie Maker, Elmo, and LCD projector which dropped from teacher use to student use, Movie Maker dropping 5.24% points, Elmo 12.08% points, and LCD Projector dropping 6.66% points. The Interactive Whiteboard and iPod did not show any increase or decrease in

perceived engagement (“Very Engaged”) from teacher use as pedagogical tools to student use as learning tools.

Table 9

Level of Student Engagement when Teachers and Students Use Technology in the Classroom-School A Teacher Results

Technology	n	Perception of Student Engagement when Technologies are Used as Pedagogical Tools BY THE TEACHER				Perception of Student Engagement when Technologies are Used as Learning Tools BY THE STUDENT				N
		Very engaged	Somewha t engaged	Not at all engaged	N/A	Very engaged	Somewha t engaged	Not at all engaged	N/A	
Internet Explorer (or other internet web browser)	15	6.67%	73.33%	6.67%	13.33%	40.00%	40.00%		20.00%	15
Microsoft Word (or other word processing program)	15	6.67%	80.00%		13.33%	26.67%	53.33%		20.00%	15
Microsoft Excel (or other spreadsheet program)	15	6.67%	26.67%	6.67%	60.00%	7.14%	21.43%		71.43%	14
Microsoft PowerPoint (or other presentation program)	16	37.50%	43.75%		18.75%	53.33%	13.33%	6.67%	26.67%	15
Microsoft Publisher (or other publishing program)	15	6.67%	13.33%		80.00%	20.00%			80.00%	15
Windows Movie Maker (or other movie editing program)	15	26.67%		13.33%	60.00%	21.43%	7.14%	7.14%	64.29%	14
Google (or other internet search engine)	15	20.00%	53.33%	6.67%	20.00%	33.33%	46.67%		20.00%	15
Digital camera	15	13.33%	26.67%		60.00%	21.43%	21.43%		57.14%	14
Flip camera (or other digital video camera)	15	20.00%	13.33%		66.67%	21.43%	14.29%		64.29%	14
LCD Projector	15	33.33%	40.00%	6.67%	20.00%	26.67%	33.33%	6.67%	33.33%	15
Elmo (or other document presenter)	16	18.75%	25.00%		56.25%	6.67%	26.67%		66.67%	15
Interactive whiteboard	15	20.00%	20.00%		60.00%	20.00%	13.33%	6.67%	60.00%	15
Wireless slate	15	26.67%			73.33%	20.00%			80.00%	15
Student response systems	15	20.00%	6.67%		73.33%	26.67%			73.33%	15
iPod (or other MP3 player)	15	26.67%	13.33%		60.00%	26.67%	13.33%		60.00%	15

Figure 6

*Level of Student Engagement “Very Engaged” - Teacher Use vs. Student Use
School A Results*

Also worth mentioning are the N/A responses to the listed technologies within the survey. In fact, two teachers, one Math teacher and one Physical Education teacher at School A marked N/A for all listed technologies for both teacher use and student use. Including these two teachers, the amount of N/A responses was quite surprising. Figure 8 shows the number of N/A responses for teacher and student uses of the listed technologies. Ten of the 15 listed technologies had greater than 50% of respondents choose N/A for teacher use as a pedagogical tool and for student use as a learning tool. These ten technologies include: Microsoft Excel,

Microsoft Publisher, Windows Movie Maker, Digital camera, Flip video camera, Elmo, Interactive Whiteboard, Wireless Slate, Student Response Systems, and iPod.

Figure 7

*Level of Student Engagement “N/A”- Teacher Use vs. Student Use
School A Results*

For the survey question, “Overall, would you say that students are more engaged when technology is used in the classroom?” 13 out of 15 (86.67%) of responding teachers (one teacher did not respond to the question) said “Yes,” only one said “No” and one, though it was not an option on the survey, wrote in “Unsure.” Some comments that were combined with an answer of “Yes” to the engagement question were accompanied by responses to the “Explain your reasoning” open-ended section which included,

I think using technology can allow them (the students) to be more actively involved in their own education. But, simply projecting a search on the wall? Very boring. The need to be creating their own documents, movies, etc. to be involved, and sadly, many are not as tech literate unless it is a cell phone, iPod, or PS2 or something. The ‘fun’ factor needs to be there (Participant 1).

When you can use technology to bring Real Life problems to students via any technology, the students are engaged (Participant A2).

Students produce more authentic products with assessments and quiet students sometimes come out of their shell. I could go on for pages... (Participant A3).

They seem excited that it is being used. It seems to them as though education is entering their world (Participant A4).

The teacher participant (A7) that responded that wrote in “Unsure” for the question, “Overall, would you say that students are more engaged when technology is used in the classroom?” explained her answer by writing, “Technology resources are not readily available but I believe that they could be very beneficial.” The participant (A9) that responded “No” to this question explained her reasoning by writing, “Computers here are slow and we do not have up-to-date technology for them. They are slow, freeze up, or knock you off.”

Figure 8

*“Do you feel that students are more engaged when technology is used in the classroom?”
School A Teacher Results*

Administrators. Only one of the two administrators at School A responded to the survey that was given to them. The table below (Table 10) shows the one administrator's perceptions. Her perceptions are similar to that of her staff members in the technologies in which students are "Very Engaged," however she perceives a drop in interest (from "Very Engaged" to "Somewhat Engaged" from teacher use to student use for the following technologies: Internet Explorer, Google, LCD Projector, and Elmo.

Table 10

*Level of Student Engagement when Teachers and Students Use Technology in the Classroom-
School A Administrator Results*

Technology	n	Perception of Student Engagement when Technologies are Used as Pedagogical Tools BY THE TEACHER				Perception of Student Engagement when Technologies are Used as Learning Tools BY THE STUDENT				
		Very engaged	Somewha t engaged	Not at all engaged	N/A	Very engaged	Somewha t engaged	Not at all engaged	N/A	N
Internet Explorer (or other internet web browser)	1	100%					100%			1
Microsoft Word (or other word processing program)	1		100%				100%			1
Microsoft Excel (or other spreadsheet program)	1		100%				100%			1
Microsoft PowerPoint (or other presentation program)	1	100%				100%				1
Microsoft Publisher (or other publishing program)	1		100%			100%				1
Windows Movie Maker (or other movie editing program)	1	100%				100%				1
Google (or other internet search engine)	1	100%					100%			1
Digital camera	1	100%				100%				1
Flip camera (or other digital video camera)	1	100%				100%				1
LCD Projector	1	100%					100%			1
Elmo (or other document presenter)	1	100%					100%			1
Interactive whiteboard	1	100%				100%				1
Wireless slate	1	100%				100%				1
Student response systems	1	100%				100%				1
iPod (or other MP3 player)	1	100%				100%				1

For the survey question, “Overall, would you say that students are more engaged when technology is used in the classroom?” the administrator from School A (Participant A17) said “Yes.” For her reasoning, she stated that “Outside of the school, students use technology ALL of the time. They are used to that mode of communication- that is the “NORM” for them. Teachers need to use the mode of communication that students relate to best.”

Figure 9

“Do you feel that students are more engaged when technology is used in the classroom?” - School A Administrator Results

Relationship between the perceptions of one’s own technology skills and the perception of how students are engaged with technology. The second research question, “How does the perception of one’s own technology skills relate to one’s perception of how students are engaged with technology?” looks at both teacher and administrator perceptions of their own technology skills and their perception of how students are engaged with technology. It looked at each aspect separately then looked to see if a relationship existed between the two.

Teacher and administrator perceived confidence with using the listed technologies for personal and professional uses were addressed within the survey instrument. The results, as a group, are found in the upcoming tables and text.

Teachers. In looking at Table 11, one notices the difference in confidence with the different types of technologies.

Table 11

Level of Confidence when Teachers Use Technology Tools/Programs
School A Teacher Results

Technology	PERSONAL USE					PROFESSIONAL USE				
		Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	
Computer	16	93.75%	6.25%			87.50%	12.50%			16
Email	16	100.00%				93.75%	6.25%			16
Internet Explorer (or other internet web browser)	15	100.00%				100.00%				15
Microsoft Word (or other word processing program)	15	93.33%	6.67%			86.67%	13.33%			15
Microsoft Excel (or other spreadsheet program)	16	31.25%	43.75%	25.00		37.50%	25.00%	37.50%		16
Microsoft PowerPoint (or other presentation program)	16	56.25%	31.25%	12.50%		50.00%	31.25%	18.75%		16
Microsoft Publisher (or other publishing program)	15	13.33%	40.00%	46.67%		13.33%	26.67%	53.33%	6.67%	15
Windows Movie Maker (or other movie editing program)	16	31.25%	12.50%	56.25%		25.00%	18.75%	50.00%	6.25%	16
Google (or other internet search engine)	16	100.00%				100.00%				16
Digital camera	16	81.25%	18.75%			68.75%	18.75%	6.25%	6.25%	16
Flip camera (or other digital video camera)	16	62.50%	12.50%	25.00%		50.00%	12.50%	25.00%	12.50%	16
LCD Projector	14	64.29%	21.43%	7.14%	7.14%	64.29%	28.57%	7.14%		14
Elmo (or other document presenter)	16	31.25%	12.50%	43.65%	12.50%	31.25%	12.50%	43.75%	12.50%	16
Interactive whiteboard	16	12.50%	37.50%	50.00%		12.50%	31.25%	50.00%	6.25%	16
Wireless slate	15	13.33%	20.00%	60.00%	6.67%	13.33%	20.00%	60.00%	6.67%	15
Student response systems	16	12.50%	18.75%	62.00%	6.25%	12.50%	12.50%	68.75%	6.25%	16
iPod (or other MP3 player)	16	68.75%	18.75%	12.50%		50.00%	25.00%	18.75%	6.25%	16
Text Messaging (via cell phone)	16	68.75%	12.50%	18.75%		50.00%	6.25%	31.25%	12.50%	16

The basics: computer, email, Internet Explorer, Microsoft Word, and Google, all have above 90% of respondents feeling “Very Confident” for personal use and only slightly lower percentages for professional use for these technologies. But, if we look at other Microsoft programs that are often bundled with Microsoft Word such as PowerPoint, Excel, and Publisher, we find that they are below 60% feeling “Very Confident,” some even rated as “Not at All Confident,” especially for professional use. Even technologies such as digital cameras, flip video cameras, iPods, and Text Messaging are listed with over 60% of respondents from School A feeling “Very Confident.” Less than 15% of respondents felt “Very Confident” in using Microsoft Publisher, Interactive Whiteboards, Wireless slates, and Student Response Systems (clickers) either for personal or professional use.

When asked on with an open-ended question on the survey, teacher respondents from School A mentioned a lack of use or familiarity as being a barrier for them feeling confident in using said programs/technologies. Additional reasoning for confidence or lack of confidence listed on the survey was availability in their classrooms/schools, only having access at training sessions, set-up time required, and lack of training. Age was also listed as a reason for confidence or lack of confidence by three out of 16 teacher participants from School A. Two mentioned that they are very confident in technology use because of their age. One participant (A7), wrote on her survey that a factor contributing to confidence or lack of confidence with using these examples of technology is, “Age and culture I grew up with” and Participant A11 wrote, “I am a younger teacher, grew up around technology. On the other hand, another teacher wrote in regard to the factor contributing to her lack of confidence with technology was, “My age. I will be [age] this year and find it somewhat hard to change.”

When comparing confidence levels for personal and professional use, there was a slight difference for most technologies listed between personal and professional use. Figure 10 shows

the results of this comparison. For most of the technologies listed on the survey instrument, it appeared that if a participant was confident with it for personal use, that they were slightly less confident for professional use. Only one of the technologies listed, Microsoft Excel, showed an increase in confidence for professional use as compared to personal use. Nine of the 18 technologies showed a decrease in confidence from personal use to professional use and the other eight listed technologies stayed the same level of confidence for personal use as compared to professional use.

Figure 10

*Level of Teacher Confidence- "Very Confident"- Personal Use vs. Professional Use
School A Teacher Results*

In attempting to compare teacher confidence levels with their perceptions of student engagement, it was imperative that a system be developed to rank teachers based on their responses to the confidence questions on the survey. Teacher respondents were given two points for every technology they listed as feeling “Very Confident,” were given one point for each technology listed as “Somewhat Confident,” and zero points for those listed as “Not at all Confident.” Once the scores were totaled for personal and professional use for each participant, their score was divided by the possible 38 points that they could have earned in order to get a percentage score. Participants scoring a 50% or higher for both personal and professional use are considered to be “tech confident” were grouped together in order to look for a relationship between confidence and perceptions of student engagement. Table 12 shows the demographic information along with the confidence levels, personal and professional, for each teacher participant from School A.

In Table 12, teacher confidence levels for using technology for personal and professional uses are listed along with the demographic information on each participant. In looking at those that are deemed for this research to be “tech confident,” out of the 16 teachers at School A who responded to the survey, eight (50.00%) are “tech confident.” Of the eight, six are 35 or below in age range, the other two are between 36 and 45 years of age. All eight, “tech confident” participants have been teaching 10 or fewer years.

Table 12

*Demographic Information Including Technology Confidence Levels
School A Teacher Results*

SCHOOL CODE PARTICIPANT CODE	AGE RANGE	GENDER	YEARS OF TEACHING EXPERIENCE	SUBJECT(S) TAUGHT	Technology Confidence Level for Personal Use	Technology Confidence Level for Professional Use
A1	26-35	FEMALE	6-10	SOCIAL STUDIES	89.47%	89.47%
A2	55 AND ABOVE	FEMALE	26 AND ABOVE	MATH	36.84%	31.58%
A3	26-35	FEMALE	6-10	FRENCH	94.74%	94.74%
A4	26-35	MALE	6-10	READING/LANGUAGE ARTS	76.32%	68.42%
A5	36-45	MALE	16-20	SOCIALSTUDIES	47.37%	47.37%
A6	25 AND BELOW	FEMALE	5 AND BELOW	MUSIC	60.71%	57.89%
A7	25 AND BELOW	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	76.32%	42.11%
A8	55 AND ABOVE	FEMALE	26 AND ABOVE	PHYSICAL EDUCATION/HEALTH	47.37%	47.37%
A9	36-45	FEMALE	21-25	MATH	47.37%	44.74%
A10	46-55	MALE	26 AND ABOVE	SOCIAL STUDIES	44.74%	44.74%
A11	26-35	MALE	5 AND BELOW	MATH	65.79%	63.16%
A12	46-55	FEMALE	5 AND BELOW	SPECIAL EDUCATION	47.37%	44.74%
A13	26-35	FEMALE	6-10	SPECIAL EDUCATION	44.74%	36.84%
A14	36-45	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	65.79%	50.00%
A15	26-35	FEMALE	6-10	SPANISH	100.00%	97.36%
A16	46-55	FEMALE	6-10	SPECIAL EDUCATION/READING	86.84%	86.84%

Participants shaded in gray above are deemed to be “tech confident” for due to their confidence level scores being higher than 50.00%.

Administrators. The administrator respondent from School A, Participant A17, considers herself to be very confident in technology use (See Table 10). She selected that she is “Very Confident” for 14 (77.78%) of the 18 technologies listed. The only technologies that she felt “Somewhat Confident” in using for personal and professional use included Windows Movie Maker, Flip camera, Elmo, and Wireless slates. There was one technology that moved from “Very Confident” for personal use to “Somewhat Confident” for professional use and that is the Interactive Whiteboard. When asked on with an open-ended question on the survey to “Name

some factors that attribute to your confidence or lack of confidence with using these examples of technology, Participant A17 wrote,

As an administrator, I don't use some of these technologies in front of an audience every day. At home, I don't care if I make a mistake and have to go back or redo something. If I was presenting in front of an audience, I would practice prior to the presentation. Lack of confidence is not an issue with me.

Table 13

Level of Confidence When Administrators Use Technology Tools/Programs
School A Administrator Results

Technology	PERSONAL USE				PROFESSIONAL USE			
	Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)
Computer	1	100.00%			100.00%			1
Email	1	100.00%			100.00%			1
Internet Explorer (or other internet web browser)	1	100.00%			100.00%			1
Microsoft Word (or other word processing program)	1	100.00%			100.00%			1
Microsoft Excel (or other spreadsheet program)	1	100.00%			100.00%			1
Microsoft PowerPoint (or other presentation program)	1	100.00%			100.00%			1
Microsoft Publisher (or other publishing program)	1	100.00%			100.00%			1
Windows Movie Maker (or other movie editing program)	1	100.00%				100.00%		1
Google (or other internet search engine)	1	100.00%			100.00%			1
Digital camera	1	100.00%			100.00%			1
Flip camera (or other digital video camera)	1	100.00%				100.00%		1
LCD Projector	1	100.00%			100.00%			1
Elmo (or other document presenter)	1	100.00%				100.00%		1
Interactive whiteboard	1	100.00%				100.00%		1
Wireless slate	1	100.00%				100.00%		1
Student response systems	1	100.00%			100.00%			1
iPod (or other MP3 player)	1	100.00%			100.00%			1
Text Messaging (via cell phone)	1	100.00%			100.00%			1

Administrators were also given a score based on their responses to their technology confidence responses on the survey. Participants who scored 50% or higher for both personal and professional use are considered to be “tech confident” and will be grouped together in order to look for a relationship between confidence and perceptions of student engagement. This participant, A17, is considered, for this research study, to be “tech confident” due to scoring 50.00% or higher for confidence level for personal and professional use. She scored an 89.47% “tech confidence” for personal use and an 86.84% for professional use.

Relationship between administrator perceptions of teachers’ technology skills and teachers’ perceptions of how students are engaged with technology. Of the teachers in her school, School A, that participated in the survey, 86.67% believed that students are more engaged when technology is used in the classroom. The other 13.34% was divided between 6.67% said no, they are not more engaged, and 6.67% were “unsure.” The administrator’s perception of teacher technology skills was addressed during the follow-up interview and therefore will be addressed later in chapter 4 of this document.

Perceived facilitators/barriers to using technology. The research question, “What are perceived as facilitators and/or barriers to using technology?” was addressed through the survey instrument as well as the interview. In the survey instrument, the following open-ended statement was offered for response, “Name some factors that attribute to your confidence or lack of confidence with using these examples of technology.” The responses to this open-ended statement offered a great deal of information as to the perceived facilitators/barriers. Additionally, some people addressed this in the part of the survey that asked the participants to Explain their response to the question “Overall would you say that students are more engaged when technology is used in the classroom” and one or two wrote information relevant to this

research question where the survey asked, “What else would you like to add that has not been addressed in this survey?”

Teachers.

Availability and use of technologies. Use (independently and training) and availability of the technologies seemed to be a common theme. In response to the survey question, “Name some factors that attribute to your confidence or lack of confidence with using these examples of technology,” one teacher wrote, “I use technology personally and professionally every day, so I’m quite comfortable. The more I use the technology, the more comfortable I am using it” (Participant A15). More teacher responses are as follows: Participant A1 said, “I don’t use Publisher often, so I’m not as familiar with it... I don’t have a whiteboard, a slate, or the student response systems in my classroom, so I’ve only used them at training sessions. However, I think that they would be easy enough to use with some practice. That being said, I’d love to have my own!” “Text messaging, iPod, Interactive Whiteboard, do not own or have available to use. Participant A4 wrote, “I use a lot of technology in my personal life. I think this helps when applying it to school.” Participant A5 wrote, “Lack of training/lack of technology in the classroom” and Participant A6 wrote, “I do not have several of these forms of technology.” “I’m confident with what I use every day. These other examples of technology are rarely used in my life- school or home; therefore, I am not as confident” (Participant A13). “The ones I use, I am good at” (Participant A8) and Participant A9 simply states, “Don’t use them enough.”

Age. In response to the survey question, “Name some factors that attribute to your confidence or lack of confidence with using these examples of technology,” one participant wrote “Age and culture I grew up with” saying that her age was a facilitator to using technology since she grew up with it. Another teacher added, “I’m a younger teacher, grew up around

technology.” On the other end of the spectrum, a teacher (Participant A12) responded by saying, “My age. I will be [age] this year and find it somewhat hard to change.”

Lack of current, usable technology. Participant A9 answered “No” on her survey in response to the question, “Overall, would you say that students are more engaged when technology is used in the classroom?” Her reasoning was “Computers here are slow and we do not have up-to-date technology for them. They are slow, freeze up, or knock you off.”

Participant A15 mentioned wanting to use the Classroom Performance System (clickers) in her class but not being able to get “Deep Freeze” off to download the program to use it yet. This county requires that all computers on the network be loaded with “Deep Freeze” as security.

According to the company’s website,

Faronics Deep Freeze makes computers indestructible and prevents against unwanted workstation changes—regardless of whether they are accidental or malicious. Deep Freeze is proven to reduce helpdesk support incidents and allows IT personnel to focus on more strategic IT needs.

In order to install any programs, the technology person from the school or county-level has to turn off “Deep Freeze” then install the program/software, then turn “Deep Freeze” back on.

Administrators. Participant A17, an administrator at School A, states that “Outside of the school, students use technology ALL of the time. They are used to that mode of communication- that is the “Norm” for them. Teachers need to use the mode of communication that students relate to best.” She says in her survey response that a lack of confidence in general on the teachers’ parts is a barrier to their technology use.

Additional training opportunities would help this, she says.

Trainings/learning experiences to use available technologies. Within the survey instrument, teachers and administrators were asked to “Name some of the most beneficial technology staff development sessions that you have attended.” They were also asked on the

survey, “Besides staff development sessions, what other technology learning experiences have you had (i.e. university courses, community classes, personal lessons with family or friends)?” Similar questions were also asked of participants in the follow-up interview.

Teachers.

Professional development. On the survey instrument, many participants mentioned beneficial staff development sessions they had attended and a few additional ones were added during the interviews. A few of those listed professional development sessions include: training on use of new software associated with new instructional materials, WVDE Webtop training, Teacher Leadership Institute, Special Education Teacher Leadership Institute, Podcasting/Whiteboard/Photo Story training, school staff development sessions, Technology Integration workshop, TechSteps (technology literacy program) training, Audacity, Acuity (standardized test practice), Microsoft Office workshops, Instructional Games within Microsoft Word, and the WV Social Studies Institute.

One participant (A5) added to their survey response regarding professional development that there is a “limited impact due to the lack of technology in schools.” Another (A6) said, “All staff development on technology goes so fast and is so short. It makes you feel like you have to use technology all of the time or you are not a good teacher.”

Additional learning experiences. In addition to school, county, Regional Education Service Agency (RESA), and state trainings, participants were asked to name additional technology learning experiences they have had, from family, friends, classes, and outside training sources. They were asked to name these on both the survey and during the interview. Two (12.5%) of the 16 participants from School A mentioned

learning on their own. Participant A1 said, “Pretty much everything I learned on my own either before or during college. I’ve had no structured learning courses for college, etc.” Participants A5 agreed that he was “self-taught.” Participant A7 said her Dad and brother are “very proficient in all things technology related” and that they have helped her. Participant A16 mentioned a friends and neighbor who taught her to use Windows Movie Maker. Participant A3 mentioned her master’s degree program as one that required her to learn a great deal of technology, even submitting online portfolios. Participant A4 also mentioned his graduate courses as well as being assisting in developing his technology skills. Governor’s Honors Academy as well as Intel- Teach to the Future workshops were also mentioned as other placed where technology was presented and learned.

Administrators.

Professional development. On the survey instrument participant A17 named “some of the most beneficial technology staff development sessions that you have attended.” She stated, “Staff developments on how to use the whiteboard, Elmo, and student response systems” were the most beneficial to her.

Additional learning experiences. The survey instrument asked respondents to name other technology learning experiences, besides professional development sessions. Participant A17 responded by writing on her survey, “I learned primarily by trial and error.”

School B

Perceptions of how students are engaged with technology. Within in the survey instrument, teachers and administrators were asked to rate their perception of the level of student engagement when specific technologies are used in the classroom by the teacher as pedagogical tools or by the student as learning tools. Participants were asked to state whether they felt that

students were Very Engaged, Somewhat Engaged, Not at All Engaged, or N/A. This addressed the first research question for this study, “What is the perception of how students are engaged with technology?”

Teachers. Teachers in School B were also asked in their survey to rate their perception of the level of student engagement when specific technologies are used in the classroom by the teacher as pedagogical tools or by the student as learning tools. The results for School B are found in Table 14.

Table 14

Level of Engagement when Teachers and Students Use Technology in the Classroom
School B Teacher Results

Technology	n	Perception of Student Engagement when Technologies are Used as Pedagogical Tools BY THE TEACHER				Perception of Student Engagement when Technologies are Used as Learning Tools BY THE STUDENT				N
		Very engaged	Somewha t engaged	Not at all engaged	N/A	Very engaged	Somewha t engaged	Not at all engaged	N/A	
Internet Explorer (or other internet web browser)	23	39.13%	56.52%		4.35%	69.57%	21.74%		8.70%	23
Microsoft Word (or other word processing program)	22	13.64%	59.09%	18.18%	4.55%	28.57%	57.14%		14.29%	21
Microsoft Excel (or other spreadsheet program)	21		38.10%	9.52%	52.38%	19.05%	19.05%	4.76%	57.14%	21
Microsoft PowerPoint (or other presentation program)	22	50.00%	45.45%		4.55%	72.73%	13.64%		13.64%	22
Microsoft Publisher (or other publishing program)	21	23.81%	14.29%		52.38%	28.57%	14.29%		57.14%	21
Windows Movie Maker (or other movie editing program)	21	27.27%	50.00%		61.90%	25.00%	5.00%		70.00%	20
Google (or other internet search engine)	22	27.27%	50.00%		22.72%	50.00%	36.36%		13.64%	22
Digital camera	20	15.00%	20.00%		65.00%	25.00%	10.00%		65.00%	20
Flip camera (or other digital video camera)	21	19.05%	14.29%	4.76%	61.90%	25.00%	10.00%		65.00%	20
LCD Projector	21	33.33%	52.38%		4.29%	38.10%	14.29%		47.62%	21
Elmo (or other document presenter)	21	23.81%	33.33%		42.86%	28.57%	23.81%		47.62%	21
Interactive whiteboard	21	33.33%	19.05%		47.62%	33.33%	9.52%		57.14%	21
Wireless slate	21	19.05%	4.76%		76.19%	19.05%	4.76%		76.19%	21
Student response systems	21	23.81%	14.29%		61.90%	28.57%	9.52%		61.90%	21
iPod (or other MP3 player)	22	22.73%	13.64%		63.64%	19.05%	9.52%		71.43%	21

Results of note from this page of survey results for School B were that most, 11 out of 15 (73.33%), of the technologies listed increased in level of “Very Engaged” from teacher use as pedagogical tools to student use as learning tools. Figure 12 shows the change between teacher use and student use in perceptions of students being “Very Engaged.” The technologies showing the greatest increase in perceived engagement from teacher to student use included Internet Explorer which showed a 30.44% point increase, Microsoft Word which increased by 14.93%, Microsoft Excel which increased 19.05% points (from 0% for teacher use), Microsoft PowerPoint which increased by 22.73% points, and Google which increased by 22.73% points. The only exception to this was iPod which dropped 3.68% points from teacher use to student use and Windows Movie Maker which went from 27.27% to 25.00%. The Interactive Whiteboard and wireless slate which stayed the same from teacher to student use.

Figure 11

*Level of Student Engagement “Very Engaged”- Teacher Use vs. Student Use
School B Teacher Results*

Also worth mentioning are the N/A responses to the listed technologies within the survey. One teacher left this entire page of the survey blank while another, the Plato lab teacher who remediates using a pre-developed remediation software program on computers, selected N/A for all listed technologies for both teacher use and student use. Figure 12 shows the number of N/A responses for teacher and student uses of the listed technologies. Eight of the 15 technologies had results of over 50% of respondents selecting N/A for student engagement when that technology is used by the teacher or student. Those technologies include: Microsoft Excel, Microsoft Publisher, Windows Movie Maker, Digital Camera, Flip video camera, Wireless slate, Student Response Systems, and iPod.

Figure 12

*Level of Student Engagement “N/A”- Teacher Use vs. Student Use
School B Teacher Results*

For the survey question, “Overall, would you say that students are more engaged when technology is used in the classroom, 23 out of 23 (100%) of responding teachers from School B said “Yes.” Figure 13 shows the results.

Figure 13

*“Do you feel that students are more engaged when technology is used in the classroom?”
School B Teacher Results*

Some comments that were combined with an answer of “Yes” to the engagement question were accompanied by responses to the “Explain your reasoning” open-ended section which included,

We use a Playstation 2 and Wii for class on occasion and those classes are more involved than when we just use our normal P.E. equipment (Participant B2).

Students are challenged when they use the technology. Their perception of the teacher relevance (ability to teach in a relevant way) is much higher (Participant B3).

It is simply something different, which makes it more engaging than listening to a teacher lecture. It can be more student directed rather than teacher directed (Participant B4).

They are technology minded- that is how they use their spare time (Participant B6).

They enjoy seeing and using new technology. It can leave a lasting, visible, concrete memory, more so than lecture and sometimes hands-on experiences (Participant B10).

Administrators. Two of the four administrators at School B responded to the survey that was given to them. The following table, (Table 15), shows the administrators' perceptions of student engagement when teachers and students use technology in the classroom. Of their responses, the only technologies that both administrators agreed caused the students to be "Very Engaged" was the Interactive Whiteboard, as a pedagogical tool when used by the teacher and as a learning tool when used by the student. Additionally, both administrators felt that the Flip Camera was very engaging when used by the student as a learning tool.

Table 15

*Level of Student Engagement when Teachers and Students Use Technology in the Classroom
School B Administrator Results*

Technology	n	Perception of Student Engagement when Technologies are Used as Pedagogical Tools BY THE TEACHER				Perception of Student Engagement when Technologies are Used as Learning Tools BY THE STUDENT				
		Very engaged	Somewha t engaged	Not at all engaged	N/A	Very engaged	Somewha t engaged	Not at all engaged	N/A	N
Internet Explorer (or other internet web browser)	2		100%			50%	50%			2
Microsoft Word (or other word processing program)	2		100%				100%			2
Microsoft Excel (or other spreadsheet program)	1		100%				100%			1
Microsoft PowerPoint (or other presentation program)	2	50%	50%			50%	50%			2
Microsoft Publisher (or other publishing program)	2		100%				100%			2
Windows Movie Maker (or other movie editing program)	1				100%	50%			50%	2
Google (or other internet search engine)	2	50%	50%			50%	50%			2
Digital camera	2	50%	50%			50%	50%			2
Flip camera (or other digital video camera)	2	50%	50%			100%				2

LCD Projector	2	100%		100%		2
Elmo (or other document presenter)	2	100%		100%		2
Interactive whiteboard	2	100%	100%			2
Wireless slate	2	50%	50%	50%	50%	2
Student response systems	2	50%		50%	50%	2
iPod (or other MP3 player)	1	100%		100%		1

For the survey question, “Overall, would you say that students are more engaged when technology is used in the classroom?” Both of the responding administrators said “Yes.” Their reasoning listed for answering “Yes,” includes:

Technology- when well applied, definitely develops interest level (Participant B25).

Today’s students have grown up with technology and they are very comfortable using all kinds. Students have been conditioned from an early age to relate to or respond to technology- so why not use it to its maximum potential in our classrooms (Participant B26).

Figure 14

*“Do you feel that students are more engaged when technology is used in the classroom?”
School B Administrator Results*

Relationship between the perceptions of one's own technology skills and the perception of how students are engaged with technology. The second research question, “How does the perception of one's own technology skills relate to one's perception of how students are engaged with technology?” looks at both the teacher and administrator perceptions of their own confidence when the listed technologies are used for personal and professional use. The results to this question can be found in Table 16.

Table 16

*Level of Confidence When Teacher Use Technology Tools/Programs
School B Teacher Results*

Technology	n	PERSONAL USE				PROFESSIONAL USE				n
		Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	
Computer	23	91.30%	8.70%			86.96%	13.04%			23
Email	23	95.65%	4.35%			95.65%	4.35%			23
Internet Explorer (or other internet web browser)	23	95.65%	4.35%			95.65%	4.35%			23
Microsoft Word (or other word processing program)	23	100.00%				100.00%				23
Microsoft Excel (or other spreadsheet program)	23	34.78%	39.13%	26.09%		34.78%	30.43%	34.78%		23
Microsoft PowerPoint (or other presentation program)	23	78.26%	21.74%			78.26%	21.74%			23
Microsoft Publisher (or other publishing program)	23	21.74%	39.13%	39.13%		21.74%	34.78%	43.48%		23
Windows Movie Maker (or other movie editing program)	23	13.04%	39.13%	47.83%		26.09%	17.39%	47.83%	8.70%	23
Google (or other internet search engine)	23	39.13%	30.43%	30.43%		95.65%	4.35%			23
Digital camera	23	60.87%	34.78%	4.35%		47.83%	39.13%	8.70%	4.35%	23
Flip camera (or other digital video camera)	22	31.82%	36.36%	31.82%		27.27%	36.36%	31.82%		22
LCD Projector	22	72.73%	13.64%	13.64%		72.73%	18.18%	9.09%		22
Elmo (or other document presenter)	21	42.86%	23.81%	33.33%		42.86%	23.81%	33.33%		21
Interactive whiteboard	22	9.09%	40.91%	50.00%		13.64%	36.36%	50.00%		22
Wireless slate	22	9.09%	18.18%	72.73%		13.64%	13.64%	72.73%		22
Student response systems	22	22.73%	22.73%	54.55%		22.73%	18.18%	59.09%		22
iPod (or other MP3 player)	22	54.55%	40.91%	4.55%		45.45%	27.27%	27.27%		22
Text Messaging (via cell phone)	23	69.57%	21.74%	8.70%		43.48%	26.09%	26.09%	4.35%	23

Table 16 shows the difference in confidence with the different types of technologies, allowing a comparison from one technology to another as well as whether the technology is used for personal or professional use. School B teachers feel very confident in using the basics: computer, email, Internet Explorer, Microsoft Word, and Google, all have above 85% of respondents feeling “Very Confident.” Microsoft PowerPoint is above 75% in confidence level for teachers, but Microsoft Excel, and Publisher received less than 35% of the teachers selecting that they feel “Very Confident,” when using those programs, some even rated as “Not at All Confident.” Less than 15% of respondents felt “Very Confident” in using Interactive Whiteboards and Wireless slates, and less than 25% feel “Very Confident” in using Student Response Systems (clickers) either for personal or professional use.

When asked on with an open-ended question on the survey, respondents mentioned a lack of experience and training with the technologies as being a barrier for them feeling they lack confidence in using said programs/technologies. Another reason for confidence or lack of confidence listed on the survey was availability of such technologies. One participant wrote, “It really just relates to the amount of experience I have had with each form of technology. Also, for personal use it is ok if I make a mistake with technology, but for professional use I would be horrified if I couldn’t get something to work properly!” (Participant B4). Another wrote, “Using personally increases professional confidence” (Participant B11). Choice was also a reason written in response to the question of what attributes to the confidence or lack of confidence with using the technology. Participant B9 wrote, “I don’t feel confident using those items. I have no need nor desire to use in classroom or personal life. I avoid use of Facebook and Text Messaging.” Another participant wrote,

Many areas are by choice. I don’t choose to use Facebook, Twitter, etc, or I would become quite confident. I never understood all of the components of Excel, so I make a choice not to gain confidence in that program. Other areas are

those that were never easily available enough for me to work a lesson around. I always liked technology to be an addition to my teaching of concepts when I was in the classroom (now in Plato Lab). I always wanted to have more contact with the students. Sometimes older teachers are considered dinosaurs, but we live in the age of technology where students are still struggling with basic skills as they always have (Participant B8).

When comparing confidence levels for personal and professional use, there was a slight difference for most technologies listed between personal and professional use. Four of the technologies listed, Google, Windows Movie Maker, Interactive whiteboards, and Wireless slates, showed an increase in confidence for professional use as compared to personal use. Five of the 18 listed showed a decrease in confidence from personal use to professional use and the other nine stayed showed the same level of confidence for personal use compared to professional use.

Figure 15

*Level of Teacher Confidence- "Very Confident"- Personal Use vs. Professional Use
School B Teacher Results*

Teachers were given a score based on their responses to their technology confidence responses on the survey. Participants who scored 50% or higher for both personal and professional use are considered to be “tech confident” and will be grouped together in order to look for a relationship between confidence and perceptions of student engagement. Table 17 shows the demographic information along with the confidence levels, personal and professional, for each teacher participant from School B.

Table 17

*Demographic Information Including Technology Confidence Levels for Personal and Professional Use
School B Teachers*

SCHOOL CODE PARTICIPANT CODE	AGE RANGE	GENDER	YEARS OF TEACHING EXPERIENCE	SUBJECT(S) TAUGHT	Technology Confidence Level for Personal Use	Technology Confidence Level for Professional Use
B1	46-55	FEMALE	26 AND ABOVE	UNIFIED ARTS	57.89%	50.00%
B2	36-45	MALE	11-15	PHYSICAL EDUCATION/HEALTH	68.42%	68.42%
B3	46-55	FEMALE	6-10	SPECIAL EDUCATION/SOCIAL STUDIES	55.26%	55.26%
B4	26-35	FEMALE	6-10	READING/LANGUAGE ARTS	65.79%	52.63%
B5	25 AND BELOW	MALE	5 AND BELOW	READING/LANGUAGE ARTS	63.16%	63.16%
B6	26-35	FEMALE	11-15	MATH/READING/SPANISH	84.21%	65.79%
B7	26-35	FEMALE	5 AND BELOW	READING/LANGUAGE ARTS	65.79%	50.00%
B8	55 AND ABOVE	FEMALE	11-15	PLATO LAB (REMEDIATION)	47.37%	47.37%
B9	55 AND ABOVE	FEMALE	26 AND ABOVE	NONE MARKED	47.37%	47.37%
B10	46-55	FEMALE	26 AND ABOVE	MATH	73.68%	71.05%
B11	36-45	MALE	11-15	SCIENCE	84.21%	76.32%
B12	55 AND ABOVE	FEMALE	26 AND ABOVE	SOCIAL STUDIES	34.21%	31.58%
B13	46-55	FEMALE	26 AND ABOVE	OTHER (NONE LISTED)	94.74%	94.74%
B14	26-35	FEMALE	6-10	SCIENCE	42.11%	36.84%
B15	36-45	FEMALE	11-15	MATH	63.16%	47.37%
B16	26-35	MALE	6-10	OTHER (NONE LISTED)	57.89%	57.89%
B17	46-55	FEMALE	21-25	SOCIAL STUDIES	47.37%	47.37%
B18	26-35	MALE	6-10	SOCIAL STUDIES	73.68%	63.16%
B19	46-55	MALE	21-25	SOCIAL STUDIES	57.89%	57.89%

B20	26-35	FEMALE	6-10	READING/LANGUAGE ARTS	84.21%	84.21%
B21	46-55	FEMALE	6-10	SPECIAL EDUCATION	52.63%	52.63%
B22	46-55	MALE	16-20	SPECIAL EDUCATION	89.47%	89.47%
B23*	46-55	MALE	26 AND ABOVE	SOCIAL STUDIES	94.74%	100.00%

Participants shaded in gray above are deemed to be “tech confident” for due to their confidence level scores being higher than 50.00%.

In Table 17, teacher confidence levels for using technology for personal and professional uses are listed along with the demographic information on each participant. Out of 23 teacher participants from School B who responded to the survey, 17 (73.91%) are deemed for this research to be “tech confident” due to scoring 50.00% or higher for confidence level for personal and professional use. Seven (41.18%) of the 17 are 35 or below in age range and eight (47.06%) are 46 and above in age. The other two (11.76%) are between 36 and 45 years of age. Nearly half (47.06%) of the teacher respondents from School B that were grouped as “tech confident” have 10 or less years of teaching experience with two (11.76%) having five or less years of experience and six (35.29%) having between six and ten years of experience. Of the remaining “tech confident” respondents, three (17.65%) have between 11 and 15 years of experience, one (5.88%) with 16 to 20 years of experience, one (5.88%) with 21 to 25 years of teaching experience, and four (23.53%) with more than 26 years of teaching experience.

. **Administrators.** Participant B25 has a higher confidence in his technology use than Participant B26. Participant B25 marked that he was “Very Confident” in seven (38.89%) of the listed technologies, including the computer, email, Internet Explorer, Microsoft Word, Digital Camera, LCD Projector, and Elmo for personal or professional use. He only marked that he was “Not at all Confident” for three (16.67%) of the technologies listed: Microsoft Publisher, Windows Movie Maker, and Student Response Systems. Participant B26, however, only marked that she was “Very Confident” with

Email, only one (5.56%) out of 18 listed technologies. She selected that she is “Not at all Confident” for seven (38.89%) of the 18 technologies listed.

Table 18

Level of Confidence When Teacher Use Technology Tools/Programs
School B Administrator Results

Technology		PERSONAL USE				PROFESSIONAL USE			
		Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)	Very Confident	Somewhat Confident	Not at all Confident	N/A (not on survey as option)
Computer	2	50.00%	50.00%			50.00%	50.00%		2
Email	2	100.00%				100.00%			2
Internet Explorer (or other internet web browser)	2	50.00%	50.00%			50.00%	50.00%		2
Microsoft Word (or other word processing program)	2	50.00%	50.00%			50.00%	50.00%		2
Microsoft Excel (or other spreadsheet program)	2		100.00%				100.00%		2
Microsoft PowerPoint (or other presentation program)	2		100.00%				100.00%		2
Microsoft Publisher (or other publishing program)	2			100.00%				100.00%	2
Windows Movie Maker (or other movie editing program)	2			100.00%				100.00%	2
Google (or other internet search engine)	2		100.00%				100.00%		2
Digital camera	2	50.00%	50.00%			50.00%	50.00%		2
Flip camera (or other digital video camera)	2		50.00%	50.00%			50.00%	50.00%	2
LCD Projector	2	50.00%	50.00%			50.00%	50.00%		2
Elmo (or other document presenter)	2	50.00%	50.00%			50.00%	50.00%		2
Interactive whiteboard	2		50.00%	50.00%			50.00%	50.00%	2
Wireless slate	2		100.00%				100.00%		2
Student response systems	2			100.00%				100.00%	2
iPod (or other MP3 player)	2		50.00%	50.00%			50.00%	50.00%	2
Text Messaging (via cell phone)	2		50.00%	50.00%			50.00%	50.00%	2

When asked to respond to the open-response statement on the survey, “Name some factors that attribute to your confidence or lack of confidence with using these

examples of technology, Participant B25 wrote, “Experience and time to try.” Participant B26, wrote “Technology that I have personally- very comfortable with because I have a lot of access to it and can work with it at my own pace. A lot of today’s technology I grew up without- I had to take classes or self teach myself in order to be somewhat comfortable.”

Administrators were also given a score based on their responses to their technology confidence responses on the survey. Participants who scored 50% or higher for both personal and professional use are considered to be “tech confident” and will be grouped together in order to look for a relationship between confidence and perceptions of student engagement. Participant B25 is considered, for this research study, to be “tech confident” due to scoring 50.00% or higher for confidence level for personal and professional use. He had “tech confidence” scores of 57.89% for both personal use and for professional use. Participant B26, on the other hand, is not considered to be “tech confident” due to scores below 50.00%. She had “tech confidence” scores of 31.58% for both personal and professional use.

Relationship between administrator perceptions of teachers’ technology skills and teachers’ perceptions of how students are engaged with technology. Of the 23 teachers that responded the survey instrument, all 23 (100.00%) said that they believe that students were more engaged when technology is used in their classroom. The administrator’s perception of teacher technology skills was addressed during the follow-up interview and therefore will be addressed later in chapter 4 of this document.

Perceived facilitators/barriers to using technology. The research question, “What are perceived as facilitators and/or barriers to using technology?” was addressed through the survey instrument as well as the interview. In the survey instrument, the following open-ended statement was offered for response, “Name some factors that attribute to your confidence or lack

of confidence with using these examples of technology.” The responses to this open-ended statement offered a great deal of information as to the perceived facilitators/barriers.

Additionally, some people addressed this in the part of the survey that asked the participants to Explain their response to the question “Overall would you say that students are more engaged when technology is used in the classroom” and one or two wrote information relevant to this research question where the survey asked, “What else would you like to add that has not been addressed in this survey?”

Teachers.

Availability and Use of Technologies. In response to the survey question, “Name some factors that attribute to your confidence or lack of confidence with using these examples of technology,” one teacher wrote,

My confidence and/or lack of confidence is directly related to the amount of training, exposure, and opportunity to use a particular type of technology. I general feel confident once I have a basic understanding and opportunity to use a particular type of technology (Participant B3).

Another teacher wrote, “Most of the types of technology that I lack confidence in are the types I have not used before or only have a limited knowledge of” (Participant B2). “I feel the confidence level is related to how much I’ve used them. Email and Internet I use multiple times a day and PowerPoint I have done many projects with. The other technologies such as Interactive Whiteboard I have only used a few times” (Participant B5). Participant B10 said, “Most of things that I am confident in are things that I use often. Technology that I am less confident in are those that I use less often.” Participants B11, B14, B18, B20, and B22 also mentioned time to use these technologies as factors that attribute to their confidence or lack of confidence with the listed technologies.

Availability goes hand-in-hand with the opportunity to use the technology. Some participants mentioned on their survey that they did not have available to them some of the listed technologies. Participant B6 wrote in response to the “Name some factors that attribute to your confidence or lack of confidence with using these examples of technology” that they are “not always available- video camera, whiteboard, elmo.” She did add, however, that “Training and availability make me confident.” Participant B7 also responded by saying, “There are four types of technology that are unavailable to me at this school; therefore I have personal confidence in these areas (except one). My professional confidence is low because I can’t use them not because I don’t know how to use them.”

Choice. Two of the 23 teachers mentioned choice as to why they are confident or lack confidence with the listed technologies. Participant B8 said that:

Many areas are by choice. I never understood all of the components of Excel, so I make a choice not to gain confidence in that program. Other areas are those that were never available enough for me to work a lesson around. I always liked technology to be an addition to my teaching of concepts when I was in the classroom. I always wanted to have more contact with the students. Sometimes older teachers are still considered dinosaurs, but we live in the age of technology where students are still struggling with basic skills as they always have.

Participant B9 also said something about choice. She said, “I don’t feel confident using those items. I have no need or desire to use in classroom or personal life. I avoid use of Facebook and Text Messaging.”

Administrators. Participants B25 and B26 feel that a combination of experience and time to try the technologies are necessary for facilitating technology use among their staff. When asked to “name some factors that attribute to your confidence or lack of confidence with using these examples of technology,” Participant B26 wrote, “Technology that I have personally- very comfortable with because I have access to it and can work with it at my own pace. A lot of today’s technology I grew up with out- I had to take classes or self teach myself in order to be

somewhat comfortable.” Participant B25 responded similarly by simply stating, “Experience-time to try” attribute to his confidence in using technology.

Trainings/Learning Experiences to Use Available Technologies. Within the survey instrument, teachers and administrators were asked to “Name some of the most beneficial technology staff development sessions that you have attended.” They were also asked on the survey, “Besides staff development sessions, what other technology learning experiences have you had (i.e. university courses, community classes, personal lessons with family or friends)?” Similar questions were also asked of participants in the follow-up interview.

Teachers.

Professional development. On the survey instrument, participants named beneficial staff development sessions they had attended and a few additional ones were added during the interviews. A few of those listed include: Microsoft Excel and PowerPoint trainings, Technology Integration workshop, Edline/GradeQuick (online homework, calendar, gradebook for parent communication). Technology training for Reading teachers, Elmo, Student Response Systems, Whiteboard, Windows Movie Maker, Project METTS (Mathematics Enhanced Through Teacher Support), Acuity, PBL Writing/Using Templates, Online Professional Development through West Virginia Department of Education, and Google Sites/Documents.

One participant mentioned, “The best was the workshop at School X (omitted for this paper) about two years ago. I was fascinated by the number of technology tools that were readily available to the teachers at that school. We were allowed to circulate and to actually use the tools as we came to them” (Participant B8). Participant B12 added, “Any hands on training or more advanced use of technology” is beneficial.

Additional learning experiences. In addition to school, county, RESA, and state trainings, participants were asked to name additional technology learning experiences they have

had, from family, friends, classes, outside training sources. They were asked to name these on both the survey and during the interview. Answers from both sources included: other employment, college, courses in another county's school district, two mentioned family (husband, son), self-taught, Dance-Dance Revolution training at West Virginia University. Family was mentioned by four of the 23 (17.39%) participants. One mentioned her son, another mentioned her husband, and yet another mentioned his parents. One participant (B8) explain further in saying, "Informally, I have learned so much from my own children over the years, as well as from fellow teachers and my students each year. The students use computers everyday and teacher themselves and each other computer skills." Participant B7 said, "All the technology that I use I learned how to use mainly from other people or from playing with it myself."

Administrators.

Professional development. On the survey instrument, participants were asked to name "some of the most beneficial technology staff development sessions that you have attended." Participant B25 stated that walkthrough and WVEIS (West Virginia Education Information System) trainings were the most beneficial to him. Participant B26 stated, "Staff development using Elmo, interactive whiteboard, and student response systems" was most beneficial."

Additional learning experiences. The survey instrument then asked respondents to name other technology learning experiences, besides professional development sessions. Participant B25 stated, "Working with our Tech Coordinator is great! She is very patient and helpful!" and Participant B26 said she learned Microsoft PowerPoint from a class taught by a friend and Microsoft Word from a class taught by her husband.

Interview Results

School A

Perceptions of how students are engaged with technology. The first research question for this study is “What is the perception of how students are engaged with technology?” This research question was addressed through the survey instrument as well as through the follow-up interview. During the interview, teachers and administrators were asked the following question, “Do you feel that students are more engaged when technology is used? Explain.”

Teachers. Of the six teacher respondents from School A, four said yes that they feel students are more engaged when technology is used and only stated positives for technology, such as,

Absolutely! They are surrounded by 40 kinds of technology everyday... until they get to school. By implementing anything that is technology based it triggers something in the students and you can physically see them straighten and their eyes focus more intently on what is going on. We are finishing a chapter about computer and technology in French II and the students are totally focused. They want to know more about things like Myspace, Facebook and Twitter as well as texting lingo. They loved a short lesson that showed them how to “text” phrases in French (Participant A3).

Other teacher respondents also spoke very highly of technology in engaging students. One said, “Yes. Students are comfortable using technology and it is now part of their daily lives. To them, having class without it seems obsolete/out of place. Nowadays, they expect it, and it is their preferred method of acquiring knowledge” (Participant A15). Another said,

“On the whole, I feel that students are more engaged when technology is used because it’s something that the students have grown up with. I feel that it would be nice to have student email accounts so that students could email assignments to me even during the school day” (Participant A16).

Two teachers of the six seemed a little hesitant in fully saying “Yes” that students are more engaged. One of the two did say yes, but then in the same statement, mentioned “glazed eyes.” She (Participant A1) said,

If it's fun for them, yes. However, I have seen students with glazed eyes while using PowerPoint almost as much as I've had to shush them because of their excitement. The glazed eyes tend to come from students who are not as prepared with their research or not as comfortable in general with computers. Most students love to create projects, and using a program makes it easier to share their creations. Plus, many students who cannot draw well or write neatly get to make something they can be happy with since they can easily snag pictures from clipart or a website and type in their info. For some students, the novel experience itself of learning something new is engaging as well.

The other hesitant participant (A2), in talking about her students' use of graphing calculators in class, mentioned, "The extra features are nice, and necessary, but can take kids' focus off what they are studying."

Another interview question was asked regarding engagement with technology: "In your opinion, what types of technology engage students most?" The summary of response for School A participants are listed below (Appendix E). One participant (A1), said, "I think any type of technology that has FUN applications is most engaging." She mentioned that any application such as PowerPoint or Movie Maker where students can personalize their projects and make them unique captures their attention and engages them. She also discussed how she observed the computer labs being used, "It is not fun to sit in front of a monitor answering multiple choice questions, nor is it fun to sit and just type an essay. That is not engagement in my opinion. I feel that much of the time we have available in our labs is eaten up by drudgery" (she was referring to the Acuity Benchmark tests that teachers are required to give their students several times a year in order to prepare them for the standardized test (WESTest)). Participant A4 said, "Students who usually seem disengaged will do better on these type of assignments (ones that require the Internet and PowerPoint)" and Participant A16 said that, "Using the computers, no matter what type of assignment, engages the students the most. Students are on task when using the computers and there tends to be no behavioral issues when the students are using the computers."

Administrators. Within the interview, the question was asked of administrator participants, “Do you feel that students are more engaged when technology is used? Explain.” Participant A17, the only administrator participant from School A, responded by saying,

I believe that student engagement relies primarily on the teacher. There are charismatic teachers who can engage students using NO technology at all. Then there are mediocre teachers who can enhance their classroom and create long term learning and student engagement using technology. To truly prepare students for the future – I believe that the answer is finding middle ground and using technology is an important part of everyday classroom.

Relationship between the perceptions of one’s own technology skills and the perception of how students are engaged with technology.

Teachers. Of the eight “tech confident” participants, five volunteered to be interviewed. Within their interviews, they were asked, “Do you feel that you are adequately prepared to teach your content using technology? Explain why or why not.” All five of the “tech confident” interviewees responded with a “Yes” while the only other teacher that was interviewed that was not in the “tech confident” group said “No.” Participant A2 that said “No” said,

No, but if I had a smart board, I would teach myself how to use it, because when I took a refresher class in High School Geometry, the teacher used the smart board, and I saw all kinds of possibilities with the graphing feature, its memory for problems taught. It was awesome, when it worked, but I could still cope if it went down, because, I have not exclusively lived with technology.

Of those that responded with a “Yes,” that they do feel prepared to teach their content with technology, some of the most interesting quotes were,

Yes. I am a digital native so even if I am unfamiliar with a technology, I dive right and play with it until I can apply it to something that will benefit my students. It is actually faster for me to create electronic activities than the paper ones (Participant A3).

Yes, I feel prepared. I have no trouble trying to figure out things on my own. As long as it is available, I will use it. I definitely use it more now that I have my own equipment. I used to have to borrow laptop/projector from the library (Participant A15).

I definitely feel prepared. I am comfortable picking up and using almost new software. Most of the time, I think it's intuitive. I also look for anything that will make my job (especially the paperwork management!) easier. The hardest issue for me right now is that the resources are not readily available. Right now, I don't even know where the student response system is. I don't have a laptop to easily hook to a projector; I do not have a whiteboard, etc. When the items are not utilized on a regular basis, the enthusiasm fades because I do not want to struggle or hassle with sharing materials or scheduling times to use the stuff. I also do not have the expendable income to just go and buy my own. I am frustrated at this point since I feel like I'm falling behind (Participant A1).

So, even though teachers are confident in their abilities and feel prepared to teach their content, doesn't mean they don't have concerns. Just a couple of the mentioned concerns include available technology (easier not having to share, but if having to share, knowing where materials are kept), using technology on a regular basis to keep up enthusiasm and not forgetting how to use it.

Relationship between administrator perceptions of teachers' technology skills and teachers' perceptions of how students are engaged with technology.

Administrators. When asked, "How often, on average, do your teachers implement technology in their classroom?" Participant A17, the administrator from School A, stated:

It varies by teacher. Some teachers utilize technology on a daily basis. Others are once or twice a week. Some infrequently (only when going to the computer lab or required by Writing Assessment). Teachers seem to use the Elmos frequently... Our 3 computer labs are filled up for use every day all day. Some teachers use Flip cameras in their classroom. Other teachers do not use technology frequently.

In response to the interview question that asked, "What additional training do you feel would be required to make your teachers feel prepared to use technology to teach their content?" the administrator from School A (Participant A17) said,

Some type of accountability that states they need to use technology a certain percentage of the time and must document the usage. Then I feel the county should offer classes on technology during the summer or on IS days. It would be up to the teacher to sign up for the training that he or she feels they would like to learn.

From the interview, it is apparent that the administrator feels that there is a range in teacher ability and confidence level regarding technology use in her teachers' classrooms. She also thinks that more training/classes and accountability would increase the use of technology in her school.

Of the six teachers in this school that agreed to be interviewed, two mentioned additional training as something they would be interested in to assist them in implementing technology into their classrooms. One participant (A2) stated that, "If computer training were advanced to help teach my subject matter to students, I would take the courses offered, but, I would have a problem with access to the computers in the building," once again drawing attention to the lack of available technologies.

The six interviewed teachers at School A all said that they believe students are more engaged when technology is used, however some concerns were listed in the interview as well. For example, Participant A1 stated in response to the question, "Do you feel that students are more engaged when technology is used? Explain:" "Again, if it's fun for them, yes. However, I have seen students with glazed eyes while using PowerPoint almost as much as I've had to shush them because of their excitement." Participant A2 mentioned in regard to graphing calculator use in her math classroom, "The extra features are nice, and necessary, but can take kids' focus off what they are studying."

Perceived facilitators/barriers to using technology. The research question, "What are perceived as facilitators and/or barriers to using technology?" was addressed through the survey instrument as well as the interview. The interview questions that related to this research question were, "Do you feel that you are adequately prepared to teach your content using technology? Explain why or why not." and "What additional training do you feel would be necessary to prepare you to use technology to teach your content?" The responses to these

interview questions provided a depth of knowledge as to the perceived facilitators and barriers to using technology for teachers and administrators.

Teachers.

Availability and Use of Current Technology. In response to the interview question, “What additional training do you feel would be necessary to prepare you to use technology to teach your content?” teachers mentioned technology availability as an issue/barrier. See the responses below:

I definitely feel prepared. I am comfortable picking up and using almost new software. Most of the time, I think it’s intuitive. I also look for anything that will make my job (especially paperwork management) easier. The hardest issue for me right now is that the resources are not easily available. Right now, I don’t even know where the student response system is. I don’t have a laptop to easily hook to a projector, I don’t have a whiteboard, etc. When these times are not utilized on a regular basis, the enthusiasm fades because I don’t want to struggle with or hassle with sharing materials or scheduling time to use the stuff. I also don’t have the expendable income to just go and buy my own. I am frustrated at this point since I feel like I am falling behind (Participant A1).

If computer training were advanced to help teach my subject matter to students, I would take the courses offered, but, I would have a problem with access to the computers in the building. There are too many mandatory requirements in Middle School that make it almost impossible to get a computer lab more than 1 day (Participant A2).

I don’t feel I need additional training; however I would like to have more access to technology (Participant A15).

Administrators. Participant A17 said in her interview, when asked, “What additional training do you feel would be required to make your teachers feel more prepared to use technology to teach their content?” she responded by saying,

Some type of accountability that states they need to use technology a certain percentage of time and must document the usage. Then, I feel the county should offer classes on technology during the summer or on IS days. It would be up to the teacher to sign up for the training that he or she feels they would like to learn.

Participant A17 feels that a combination of training and accountability are needed to facilitate the use of technology in the classroom.

Training/learning experiences to use available technologies. Participants were asked in their interview, “What types of professional development have been made available to you by your school district or RESA in regard to technology use?” and “What other types of learning experiences have you had that have helped you to learn to use available technologies?” The responses to these survey and interview questions were used and are addressed in this section of results.

Teachers. In regard to the question, “What types of professional development have been made available to you by your school district or RESA in regard to technology use?” the only local trainings mentioned were Edline and Techsteps (technology literacy program). Other trainings mentioned were on the state level and included the West Virginia State Social Studies Conference, the Teacher Leadership Institute, and the West Virginia Special Education Teacher Leadership Institute.

In response to the question, “What other types of learning experiences have you had that have helped you to learn to use available technologies?” one participant (A3) mentioned her experience as a student at West Virginia University with project requirements and the online portfolio helped to develop her technology skills and confidence. She also mentioned “My personal technology guru is my husband.” Two other participants from School A mentioned teaching themselves as other learning experiences.

Administrators. When asked, “What types of professional development have been made available to you by your school district or RESA in regard to technology use?” Participant A17 from School A mentioned technology updates that are given during the administrator meetings and instructional meetings that all administrators must attend. “These are typically 15 to 20 minute sessions of things that we could take back to our school (Lexiles, web streaming, etc...).”

Participant A17 stated that, “I have just taken the initiative to learn how to use technology on my own” in response to the question about other types of learning experiences that have helped to learn to use available technologies. Additionally, she added that if she has questions, she calls the technology department head for the county or a teacher that might know how to help.

School B

Perceptions of how students are engaged with technology. The first research question for this study is “What is the perception of how students are engaged with technology?” This research question was addressed through the survey instrument as well as through the follow-up interview. During the interview, teachers and administrators were asked the following question, “Do you feel that students are more engaged when technology is used? Explain.”

Teachers. Of the five teacher respondents from School B, two said yes that they feel that students are more engaged when technology is used and only stated positives for technology such as, “Because of the video generation, students are more attentive to a screen and animation than my generation. When I first started teaching, we were happy to show filmstrips and the students thought that was a real treat” (Participant B1) and “Yes, especially since I do not use it often. It is something different rather than them having to constantly listen to my voice” (Participant B4). Three of the five teacher respondents seemed a little hesitant in fully saying “Yes” that students are more engaged. One participant said the teacher needed to appropriately guide the students to make it effective in engaging the students (Participant B5), adding further to her argument, “However, some students don't prefer using technology. Some students just like adults, refuse to acquaint themselves with technology and would rather use pencil and paper to learn.” Another mentioned that it can be engaged, but students can get bored with it, “Students are more engaged when technology is used. But as with anything else they later

become bored with it too and only perk up when something total new comes along. They will have more conversations about what they see or do with technology, especially if it is something new” (Participant B10). Another hesitant participant (B7), reminds us that just because they engaged doesn’t mean they are learning. She says, “Engaged does not mean learning. Yes, students are more engaged when you use technology because that is their way of life. They watch TV, play video games, text, Facebook, use iPod’s and MP3 players every day. Their attention span is short and they expect to be entertained. They will pay attention when you use technology, but learning comes from practice and that they don’t want to do.”

Another interview question was asked regarding engagement with technology: “In your opinion, what types of technology engage students most?” Three of the five participants mentioned games, especially interactive internet games as being ones that engaged the students. One participant (B1), even said, “My students finish the assignments as soon as they can so they can play the typing games,” showing that students are even interested in games of educational value, not just the “free time/brain-less” games that we so often relate to how they spend their time outside of school. PowerPoint, also mentioned by School A, was mentioned by two teachers as being engaging. “I feel students like technology that they can use easily. PowerPoint seems to be one that students are engaged in. Any technology in which students can be creative and express themselves, they seem to enjoy” (Participant B4). Another (Participant B7) mentioned Windows Movie Maker as well as PowerPoint because they both “require interaction.” WebQuests (online scavenger hunts for information) as well as Interactive whiteboards, and the Elmo were also mentioned. I think the common theme amongst teacher respondents from School A and B regarding what engages students is student interaction with the technology. Participant B5 said, “Technology in which they must actually do something and participate (engage them most).”

Administrators. Within the interview, the question was asked of administrator participants, “Do you feel that students are more engaged when technology is used? Explain.” “Yes, absolutely. It plays to their language and comfort zone” (Participant B25). Participant B26 stated in the interview, “Yes, for the simple reason they cannot sit and just listen anymore. They have to be engaged in order to learn. The more ways we involve our students the better.”

Relationship between the perceptions of one’s own technology skills and the perception of how students are engaged with technology.

Teachers. Of the sixteen, “tech confident” participants, five volunteered to be interviewed. Within their interviews, they were asked, “Do you feel that you are adequately prepared to teach your content using technology? Explain why or why not.” Three of the “tech confident” interviewees from School B responded with a “Yes.” Two other teachers in the “tech confident” group said “Not really” or “I would feel more comfortable if...” Participant B4 said, “Not really- I am not sure how to use technology to teach beyond using Microsoft Word, the Internet, Power Point, and the basics. I would be willing to do more if I had more help or training.” Participant B1 said, “I would feel more comfortable having more training, especially since I am in a room full of computers each day. I suppose I have enough for my content area.” Of those that responded with a “Yes,” that they do feel prepared to teach their content with technology, some of the most interesting quotes were,

I do. I feel that I am adequately prepared for teaching with technology. I feel if teachers have an open mind about technology, it can be extremely beneficial in the classroom (Participant B5).

Yes. I create PowerPoint presentations and Windows Media movies for content. I use Word to write their thoughts so they can see them. I use the Elmo to go over work or to model what I want them to do. I allow them to put examples on the Elmo. When something is projected on the whiteboard, I’ll have students come up to identify things we’re learning about (Participant B7).

Yes, because I am constantly finding sites to use and Power Points to show that cover content (Participant B10).

Even though teachers are confident in their abilities and feel prepared to teach their content, doesn't mean they don't have concerns.

Relationship between administrator perceptions of teachers' technology skills and teachers' perceptions of how students are engaged with technology.

Administrators. When asked, "How often, on average, do your teachers implement technology in their classroom?" Participant B25 stated "About 30% use technology daily, 30% use it 2-3 times weekly, and the final 40% rarely (less than once every other week)." Participant B26 stated that teachers at her school use computers, LCD projectors, and Dance Dance Revolution daily. She also stated that the teachers use the Elmo, TV/VCR/DVD, cassettes, whiteboards, and calculators weekly and personal responders monthly.

In response to the interview question that asked, "What additional training do you feel would be required to make your teachers feel prepared to use technology to teach their content?" Participant B25 mentioned only training regarding RTI materials and the IEP program. Participant B26 mentioned training in general in response to the question. She said, "The district should allow time for each school's tech person to train or retrain teachers in available technology. Teachers need hands on training to feel comfortable enough to use it in their lessons."

Perceived facilitators/barriers to using technology. The research question, "What are perceived as facilitators and/or barriers to using technology?" was addressed through the survey instrument as well as the interview. The interview questions that related to this research question were, "Do you feel that you are adequately prepared to teach your content using technology? Explain why or why not." and "What additional training do you feel would be necessary to prepare you to use technology to teach your content?" The responses to these

interview questions provided a depth of knowledge as to the perceived facilitators and barriers to using technology for teachers and administrators.

Teachers.

Availability and use of technology. Within the interview, in response to the question that asked, “What additional training do you feel would be necessary to prepare you to use technology to teach your content?” Participant B5 responded by saying,

Unfortunately, with the size of our school and the limited resources it is difficult to have the students use technology. I can use technology in my class with the projector and Internet, but only have two other PCs. I can sometimes use an Elmo machine which I have had training on through peers.

Administrators. Participant B26 was specific during her interview when she said, in response to the question, “What additional training do you feel would be required to make your teachers feel more prepared to use technology to teach their content?” that the “The district should allow time for each school’s tech person to train or retrain teachers in available technology. Teachers need hands on training to feel comfortable enough to use it in their lessons.” If teachers are not comfortable with the technology, they will choose not to use it in their classrooms.

Training/learning experiences to use available technologies. Participants were asked in their interview, “What types of professional development have been made available to you by your school district or RESA in regard to technology use?” and “What other types of learning experiences have you had that have helped you to learn to use available technologies?” The responses to these survey and interview questions were used and are addressed in this section of results.

Teachers. In regard to the question, “What types of professional development have been made available to you by your school district or RESA in regard to technology use?” the only

local trainings mentioned were Techsteps and a Technology Integration professional development hosted by two teachers at a local middle school. Other trainings mentioned were on the state level and included a grant funded math program and an online course through the West Virginia Department of Education.

In response to the question, “What other types of learning experiences have you had that have helped you to learn to use available technologies?” one participant (B10) stated, “My sons have taught me how to use some of the things on my phone and some of the word processing capabilities on my computer.” She also mentioned that the TIS (Technology Integration Specialist) in her building also offers help at school. Participant B5 mentioned high school and university courses as other learning experiences and Participant B4 also mentioned university courses. Only one person, Participant B7, stated that they learned a lot of the technology themselves, by simple trial and error.

Administrators. When asked “What types of professional development have been made available to you by your school district or RESA in regard to technology use?” Participant B25 from School B mentioned mainly administrator technologies including how to access testing PowerPoints, testing disaggregation, Walkthroughs using the Palm/HP Applications. He also mentioned that teachers had been trained on Acuity and other programs as well. Participant B26 said she had been trained in previous years on the whiteboard and Elmo.

Participant B25 stated that he learns technology best in small groups and Participant B26 stated most of her training has come from personal use or from family members when asked “What other types of learning experiences have you had that helped you to learn to use available technologies?”

CHAPTER V

CONCLUSIONS

The summary of the data analysis and research findings emerged through observed trends in the quantitative data and the observed themes from participant voices and qualitative data in the interviews. This chapter includes responses to the research questions, similarities between School A and School B, differences between School A and School B, implications for educational practice, implications for future staff developments, and also implications for future research.

Responses to Research Questions

What is the Perception of How Students are Engaged with Technology?

School A. Through analysis of the survey instruments and interview transcripts, a majority of teachers and administrators who responded to the survey in School A state that students are engaged when technology is used. Out of the 16 total respondents to the survey from School A, 13 (86.67% of those that responded) stated that overall they feel students are more engaged when technology is used in their classroom. Of the other two respondents who answered this question, one (6.67%) stated that they do not believe students are more engaged when technology is used, and the other one (6.67%) stated that they were “Unsure.” The final survey respondent did not answer that specific question.

Two participants from School A did not answer “Yes” to the survey question, “Overall, would you say that students are more engaged when technology is used in the classroom?” Of the two who did not answer “Yes,” one (Participant A9) said “No” and the other wrote in the answer of “Unsure.” Participant A9 who said “No” that students are not more engaged when technology is used had a confidence score of 47.37% for personal use and 44.74% for

professional use. She is not considered for this study to be “tech confident” because her scores were below 50.00%. She marked on her Level of Confidence page on the survey that she is “Very Confident” at using eight technologies, “Somewhat Confident” at using two, and “Not at All Confident” at using eight technologies for personal use. For professional use, one of the “Very Confident” became “Somewhat Confident.” Participant A7 who wrote that she was “Unsure” if students were more engaged when technology is used in the classroom wrote for her reasoning, “Technology resources are not readily available but I believe they could be very beneficial.” She scored a 76.32% for personal use, but a 42.11% for professional use. She marked 11 of the technologies “N/A” for professional use. One might conclude that teachers who have less confidence in their own technology skills might be less likely to believe that technology engages students when used in the classroom.

When it comes to specific technologies and their engagement levels with students, administrators and teachers had varying ideas in what they felt engaged students regarding specific types of technology. Of the listed technologies on the survey, teachers and administrators listed Microsoft PowerPoint, Microsoft Word, and Internet Explorer as technologies that cause students to be “Very Engaged.” The administrator from School A marked all listed technologies except Microsoft Word, Excel, and Publisher as very engaging for students. She stated in her survey response that Microsoft Word, Excel, and Publisher are only somewhat engaging to students.

Though a majority of teachers felt that students are more engaged when technology is used, they do have concerns about the use of technology in the classroom. A few even felt that technology use might even hinder student learning at times, depending on what and how the technology was used. Participant A1 discussed during the interview her belief that “technology that has FUN applications is most engaging.” She added to that statement that PowerPoint and

Moviemaker are engaging because they can be personalized and unique, but answering multiple-choice questions on the computer is not engaging. Participant A1 also states, “I feel that much of the time we have available in our labs is eaten up by drudgery.” A note from the researcher: teachers are required in the county where this study was conducted to have all students in every core subject area complete three standardized test practices (Acuity) that takes between one and two full class periods to complete, taking up many of the days in the computer labs in these school buildings.

School B. In regard to student engagement with the use of technology, 100% of teachers and administrators at School B felt that students are more engaged when technology is used. Teachers mentioned in their interviews and surveys that technology is entertaining and that it’s what students are used to using outside of the classroom. One teacher wrote on her survey, “Students like to use technology. They are fascinated by it. They also like things that are similar to what they see in their free time. It engages them, however they don’t necessarily learn content just because of technology” (Participant B7). Although all participating teachers and administrators agreed that technology is engaging to students, there are still concerns about the use and whether it is distracting, taking away from the material being taught.

On the survey, teachers and administrators listed Microsoft PowerPoint, Microsoft Word, and Internet Explorer as technologies that are very engaging to students. Administrators (B25 and B26) at School B felt that Microsoft Word and Excel were not Very engaging for students. Participant B25 states that PowerPoint is Very Engaging, but Participant B26 did not agree, marking it only “Somewhat Engaging.” Participant B26, however, marked Windows Movie Maker as “Very Engaging” while Participant B25 marked it only as “Somewhat Engaging.”

Literature connection. Out of 42 participants in this research study, 39 stated that they believe students are more engaged when technology is used in the classroom. “Research shows

that when young adolescents are actively engaged in learning, they are more likely to achieve at higher levels” (Maday, 2008). Though from 1994, the statement from Apple’s Computer’s Classrooms of Tomorrow Report states it best, “Technology-rich classrooms produce positive changes in student engagement, and further contented that conditions for sustaining student engagement include technology within the context of a meaningful assignment, while allowing for exploration and experimentation” (Sandholtz, et. al., 1994, p. 8). Though the majority of teachers in this study agree that students are more engaged when technology is used, a few mentioned concerns with student learning from such technology, even somewhat viewing technology as a distracter for students. The Apple Report makes a good point that for conditions to exist for “sustaining student engagement” the technology has to be meaningful and interactive for students. If teachers fail to ensure that those things are in place when the technology is used, it will likely fail to have the same impact in the classroom.

How does the Perception of One’s Own Technology Skills Relate to One’s Perception of How Students are Engaged with Technology?

School A. When looking at teacher and administrator confidence with technology, participants ranked their confidence level through use of a Likert scale with the listed technologies on the survey instrument. Through this self-assessment of perceived confidence, it was obvious that there is quite a range of perceived technology skills. The survey instrument was followed up by interviews with teacher and administrator respondents.

The teacher with the lowest overall confidence from both School A and School B was Participant A2 who marked “Very Confident” for six technologies, somewhat confident for two technologies (for personal only), and for six of the remaining ten technologies, marked “Not at All Confident.” The final four technologies were left blank. Participant A2 was given a personal confidence level of 36.84% and professional confidence level of 31.58%. Though her

confidence levels were the lowest for School A, she marked “Yes” on the survey instrument in regard to “Overall, would you say that students are more engaged when technology is used in the classroom.” She explained her answer by adding, “When you can use technology to bring Real life problem solving to students via any technology, students are engaged.” Her reasoning behind her lack of confidence with technology as given on her survey include a lack of availability to use such technologies as well as a lack of time and resources.

The participant from School A with the highest confidence score was Participant A15, one of the two participants who chose to complete the available online survey instrument instead of the paper-pencil version. She had a personal confidence score of 100%, marking “Very Confident” for use of all listed technologies for personal use and had a professional confidence score of 97.36%, choosing “Very Confident” for use of all technologies except Microsoft PowerPoint (she chose “Somewhat Confident”). She chose “Yes” that she feels that overall students are more engaged when technology is used in the classroom.

The only three participants from School A that did not believe that students were more engaged when technology is used were Participants A7, A8, and A9. Participant A7 wrote on their survey instrument that she was “Unsure” whether or not students were more engaged when technology is used in the classroom. Unsure was not a choice on the survey, only “Yes” or No.” Her confidence scores were 76.32% for personal and 42.11% for professional. Participant A8 did not select an answer to the engagement question and had a 47.37% for both personal and professional confidence. Lastly, Participant A9 who marked “No” that she did not feel that technology was engaging to students, had scores of 47.37% for personal confidence and 44.74% for professional confidence. These three participants did not believe wholeheartedly that technology would increase engagement among students but did not have the lowest or highest confidence scores. Their scores were definitely below the average of the teachers in School A

(School A had a personal confidence average of 64.00% and a professional confidence average of 59.00%). Whether or not there is a link or correlation between confidence levels and belief of student engagement regarding technology use seems to be a possibility, though Participant A2 with the lowest confidence level would contradict that possibility.

School B. When looking at teacher and administrator confidence with technology, participants ranked their confidence level through use of a Likert scale with the listed technologies on the survey instrument. Through this self-assessment of perceived confidence, it was obvious that there is quite a range of perceived technology skills.

The teacher with the highest confidence level was Participant B23 who had a personal confidence level of 94.74% and a professional confidence level of 100.00%. He marked all technologies as “Very Confident” for professional use, and for personal use he had one technology that he marked as “Somewhat Confident.” Participant B26 from School B has scores of 31.58% for both personal and professional confidence and has the lowest confidence scores of all participants from School B, slightly lower than that of the teacher (B12) with the lowest scores, 34.21% (personal) and 31.58% (professional). In spite of the range in their confidence scores, all three participants mentioned here, B23, B26, and B12 all believe, just as all participants from School B, that students are more engaged when technology is used in the classroom.

From School B’s results, the researcher believes that a connection cannot be made between the technology skills of the teachers/ administrators and their perception of how students are engaged with technology. The administrator with the lowest tech confidence score, Participant B26, was one of the greatest supporters of technology for student engagement within her survey and interview, even saying “Today’s students have grown up with technology and they are very comfortable using all kinds. Students have been conditioned from an early age to

relate to or respond to technology- so why not use it to its maximum potential in our classrooms?”

A vast range of technology abilities for teachers and administrators would likely be seen in every school building in this county and throughout the country. This difference is due to learning experiences that each teacher and administrator has had, both formal and informal learning experiences as were addressed in the interview questions. Additionally, teacher choice and opinion as to the importance of technology use likely contributes to their willingness to include technology in their classrooms.

Literature connection. Ted McCain (2008), states, “schools face a different kind of student (p. 13). He continues by saying, “digital technology and online experiences have already profoundly affected the minds of young people today. Research is now confirming that the interactive visual & auditory presentation of info kids experience in the digital world is actually rewiring their brains.” He also states that even though students have changed, educators have not changed and “continue to teach as if its 1975.” This research study confirms that teachers believe technology is important in engaging students, 39 out of 42 participants agreed. However, believing that something is important to do does not make it easy or make it actually happen in the classroom.

Specific concerns addressed in the one-to-one laptop program in schools, addressed by Donovan and Strudler (2007) included teachers having concerns such as “I’m worried about teaching with the laptops because I don’t really know what to do” and “I’m concerned about being able to cover all the course requirements while being bogged down with the laptops” (p. 274). Many teachers also felt uncomfortable blending traditional pedagogies with the laptop environments. Concerns similar to those addressed in Donovan and Strudler’s study concerns were addressed by teachers during this study. A few teachers in this study mentioned not feeling

prepared to teach their content with technology, though one participant, B4 said they would be willing to do more with more training. Many teachers in this study are not confident in their use of the technology, therefore, many do not use the technology as they should. Although students have changed, many teachers have not, and some are not even willing to try to change.

How does an Administrator's Perception of their Teachers' Technology Skills

Relate to the Teachers' Perceptions of How Students are Engaged with Technology?

All three administrators, one from School A and two from School B, discussed within their survey responses and interview a variance in teacher ability and use of technology within their school building. In response to the question, "How often, on average, do your teachers implement technology in their classrooms?" Participant A17, administrator at School A, responded by saying, "Varies by teacher. Some teachers utilize technology on a daily basis. Others are once or twice a week, some infrequently (only when going to the computer lab or required by Writing Assessment)." Participants B25 and B26, administrators from School B also gave similar responses, noting technology use in a range from daily to rarely (less than once every other week) from one teacher to the next.

In many cases, the range of ability levels contributes to the use of the technologies. Those that can and are confident in using the technology, use it, and use it frequently. "A majority of our teachers use the basics, computer, laptops, projectors, TV, overheads, because they are comfortable with them and have been using them for a long time. They probably don't use new technologies because they haven't had extensive training with them" (Participant B26). Those who either cannot use it or do not have confidence in their ability, only use it when required due to requirements such as Writing Roadmap (Writing Assessment practice), Acuity (standardized test practice), and TechSteps (technology literacy program). And then there are the teachers that fall in between, those that have some ability, some confidence, but not complete

confidence. They may choose to use the technologies every once in a while, but not necessarily on a regular basis. But, even though there are teachers in each building that are more confident, and some that are less confident, nearly everyone in both school buildings, all but 4.76% of those surveyed, believe that technology as a whole, does engage students more than if it was not used, though they don't necessarily agree with what types of technology is more engaging/less engaging.

Literature connection. “The pace of technological evolution today makes it increasingly difficult for the classroom teacher to keep up with it. Given all the duties they must attend to, little time remains to explore the options that all the various new technologies might offer” (Teacher Training and Classroom Technology Integration, 2008). This statement was echoed by teachers during this study. Some even stated that their age and the culture that they grew up with caused their technology education to be hindered. Unless teachers have a comfort level with the technology, they will be hesitant to use it, even if they believe that it will improve engagement among students in their class. One teacher (Participant B9) in this study even stated, “I don't feel confident using those items. I have no need or desire to use in classroom or personal life,” in reference to the technologies that were listed on the survey instrument. Chen (2008) states, “In a classroom, the teacher perceives and defines a teaching situation, makes judgments and decisions, and then takes related actions. Therefore, to improve teacher preparation and teaching practice, educators should pay more attention to teacher beliefs because those beliefs profoundly influence decision-making processes and teaching practices” (p. 66).

What are Perceived as Facilitators and/or Barriers to Using Technology?

School A and School B both listed similar facilitators and barriers to using technology. The barriers listed include: availability and time to learn the technologies, lack of current/usable

technology, age, and choice. Facilitators included age/culture that teachers grew up with and choice.

The one barrier that was mentioned most was the availability to use the technologies. In these two schools, as in most schools, there is limited supply to available technology due to limited funding. Though teachers write grants and schools use fundraisers and school funds to purchase technology when possible, it is still very challenging to get enough technology in the hands of the teachers and students. In the county of this study, student enrollment is steadily increasing and new schools are being built every year. Due to the building of new schools, much of the technology funding goes to equipping the new schools with technology instead of replacing old and outdated technology in the existing schools.

If teachers do not have access to the technology, they struggle to learn and be comfortable with using it and additionally, the struggle to get time to use it with their classes. One teacher, Participant A1 stated, “The hardest issue for me right now is that the resources are not readily easily available. Right now, I don’t even know where the student response system is. I don’t have a laptop to easily hook to a projector, I do not have a whiteboard, etc.” In both schools, some teachers have technology from grants, from textbook adoptions, etc. that is in their classrooms and can be considered for their daily use. Other teachers must rely on borrowing from colleagues or checking out equipment from the library/media center. The challenging part of borrowing or checking out the equipment is the additional setup time and additional troubleshooting that sometimes is required when taking down and setting up equipment without help. Sometimes, this setup time and troubleshooting is so much that teachers decide it is not worth the hassle.

Lack of current and usable technology was also listed as a barrier for using technology. Teachers mentioned on their survey responses or during their interview that they struggle with

the age of the technology. Many of the computers in the buildings still run on early versions of Windows and some take as long as 15 minutes to turn on and load up. Though newer computers are being purchased, it seems as if those computers go to the computer labs and not to individual classrooms. Additionally, due to security and protecting the school networks, technology staff in the building or county have to install any new programs (hardware or software) to any/all machines. Teachers and even administrators do not have access to install programs. Sometimes this creates a delay or even a complete stall in getting technology installed or even updated with necessary updates. One teacher even mentioned having the new Student response system for her computer, but not being able to use it yet due to waiting for the install to take place on her machine.

Age and choice were both listed as facilitators by some respondents and barriers by others. Two teachers mentioned their age and culture they grew up with as facilitators, helping to develop them in their technical mindset. They felt that they had been prepared to use technology since a young age and that they really didn't know a time before technology. Another respondent said the opposite, "I will be [age] this year and find it somewhat hard to change" (Participant A12). Choice was also mentioned, that participants had chosen to learn or not learn the technologies or that they had chosen or not chosen to use specific technologies in their classrooms with their students. Teachers have the option to choose to learn the new technology or not and that seems to be a concern of administrators. Most teachers are on-board with at least attempting to be taught or to teach themselves the technology that they feel will help their students to be more engaged. A few teachers, many with low confidence in their own abilities, are hesitant to learn and implement these technologies in their classrooms, though many know it would engage their students. This is what causes a struggle with administration, how to

encourage learning and allow for opportunities for staff to learn and become more familiar with technology.

Literature connection. “Teachers who may be committed to integrating computer technology in the classroom may find the process challenging due to barriers that exist” (Keengwe, et al, 2008, p. 561). Snoeyink & Ertmer discuss some of these barriers, internal and external, including lack of equipment, lack of technical support, openness to change, as well as beliefs about teaching and technology. Barriers mentioned in this study echo those listed by Snoeyink and Ertmer. Teachers in this study listed lack of current and usable technology, training, age, and choice as their barriers to implementing technology in their classrooms.

What Trainings/Learning Experiences have been Helpful in Helping Both Teachers and Administrators Learn to Use Available Technologies?

Through the survey instrument and interview, teachers and administrators listed and discussed past learning experiences, both professional development and otherwise, that had increased their knowledge and abilities to use technology. Within both schools, teachers and administrators, many similar professional developments were discussed, particularly those on the county and school level. Most involved the “new” technologies that are part of initiatives/requirements through the state and county, such as Acuity, Writing Roadmap, TechSteps, and Edline/Gradequick. Additional trainings on basic technology programs were also mentioned.

Four teachers reported on their survey or during their interview that they had attended a Technology Integration Workshop that was held in the county a few years ago. This workshop was planned and implemented by two county teachers who felt the need for teachers to have time to experience the technologies for themselves and to learn how to implement said technologies within their current required curriculum. “The best was the workshop at School X about two

years ago. I was fascinated by the number of technology tools that were readily available to the teachers at that school. We were allowed to circulate and to actually use the tools as we came to them” (Participant B8). These four teachers stated how beneficial this workshop was for them because they could actually try out the technology and see how easy or difficult it would be to use in their classrooms. Teachers who attended the workshop were even given sample lessons and ways to use it in the various content areas.

Teachers and administrators stated that much of their learning of technology has come from sources other than formal professional development. Many reported being self-taught, the younger generation of teachers especially. Others stated family such as parents, sisters, brothers, spouses, and even children who have helped show them how to use different technologies and programs over the years. Friends and colleagues were also reported as “trainers” as well.

When asked “What additional training do you feel would be necessary to prepare you to use technology to teach your content,” teachers reported the same barriers that were mentioned above: availability and time to use the technology as well as slower trainings where they could actually use the technology. Other discussed ways to implement the technology in their content. Troubleshooting was also discussed as something that would be a great training. Some teachers, especially those with a little confidence are really easily discouraged the minute something goes wrong with the technology. One teacher in this study, Participant B1, when asked “What additional training do you feel would be necessary to prepare you to use technology to teach your content?” answered with one word, “troubleshooting.” Sometimes, all it takes is one problem while they are using the technology for them to give up and not try to use it again.

The key factors when it comes to training teachers for using technology in their classrooms are to make them comfortable with using it. For many teachers that will be giving them time to have that piece of technology in their hands and actually be able to use it. For other

teachers it is sitting down with a friend or colleague and “playing” with the technology. And for some, it is attending a presentation where they watch someone use the technology. Each teacher, like each student, learns differently, but until they feel confident in their ability to use the technology, it will sit on the shelf or in the drawer and not be used at all.

Literature connection. “The teacher is the gatekeeper of change in the classroom, and professional development designed to change teacher practice must be guided by and integrated with teachers’ existing values, valences, knowledge, and behaviors” (Giordano, 2007, p. 115). Chen (2008) states, “What determines the instruction that takes place behind the classroom door is the teacher rather than external educational agenda or requirements” (p. 65). It is ultimately up to the teacher as to whether or not they will implement technology in the classroom. Administrators or school systems could provide every teacher in the building with all of the technology they could possibly want, but it would be up to the teacher as to how frequently it is used, if ever. To ensure it is used, teachers must be confident in using it as is seen in this study. The best way to build teacher confidence is through professional development or other learning experiences. The best learning experiences for teachers and administrators in this study were those in which they got to interact with the technology in a hands-on workshop format or through a one-on-one experience with a friend, family member, or colleague. “By acknowledging teacher concerns, change facilitators can support teachers throughout the change process” (Donovan, et al., 2007, p. 279).

Summary of the Findings

The purpose of this study was to determine how middle school teachers and administrators perceive how students are engaged when technology is used in their classrooms. Additionally, teachers' perceptions of their own technology skills were studied to see if there was

a relationship between their perceived technology skills and their attitude toward its effectiveness to engage middle school students. In addition, staff development and other technology learning opportunities were addressed.

Similarities between School A and B

Through analysis of the survey instruments and interview transcripts, it is apparent that a majority of teachers and administrators in both School A and School B think that students are engaged when technology is used. Out of the 42 total respondents to the survey, 39 (92.86%) stated that overall, they feel students are more engaged when technology is used in their classroom. Of the other three respondents, one (2.38%) stated that they do not believe students are more engaged when technology is used, one (2.38%) stated that they were “Unsure,” and one (2.38%) did not answer the question.

When it comes to specific technologies and their engagement levels with students, administrators and teachers had somewhat varying ideas in what they felt engaged students regarding specific types of technology. Of the listed technologies on the survey, teachers and administrators alike listed Microsoft PowerPoint and Internet Explorer as technologies that are cause students to be “Very Engaged.”

Both School A and School B have teachers with varying levels of confidence in their technology skills. School A had a teacher (Participant A2) with low “tech confidence” with a personal confidence level of 36.84% and professional confidence level of 31.58% and a teacher that was considered to be very tech confident with a personal confidence of 100.00% and a professional confidence of 97.36%. At School B, the teacher with the lowest “tech confidence” was Participant B12 with a personal confidence of 34.21% and a professional confidence of

31.58%. The teacher at School B with the highest “tech confidence” was Participant B23 who had a personal confidence level of 94.74% and a professional confidence level of 100.00%.

Just as was the case for School A, School B teachers feel very confident in using the basics: computer, email, Internet Explorer, Microsoft Word, and Google, all have above 85% of respondents feeling “Very Confident.” Microsoft PowerPoint is above 75% in confidence level for teachers, but Microsoft Excel, and Publisher received less than 35% of the teachers selecting that they feel “Very Confident,” when using those programs, some even rated as “Not at All Confident.” Programs such as Microsoft Excel and Publisher are not used by many for personal use and therefore they are much more difficult to gain confidence in. Most people likely gain their confidence with technology through its use and therefore if it is not used frequently, confidence is not gained. That is the likely the reasoning behind why the “basics” such as computer, email, Internet Explorer, Microsoft Word, and Google, have such a high confidence level, because they are used frequently for both personal and professional use.

School A and School B both listed similar facilitators and barriers to using technology. The barriers listed include: availability and time to learn the technologies, lack of current/usable technology, age, and choice. Additionally, several reported making mistakes and how it is one thing to make mistakes and have to learn as you go when you are using the technology personally, but it is another to make mistakes when using the technology professionally, especially in front of a classroom. The fear of making mistakes causes many teachers to refuse to try new technology in the classroom. Facilitators included age/culture that teachers grew up with and choice. Both schools studied are within the same county and have had the same professional development opportunities made available to them. Perhaps studying teachers and administrators from schools outside of the county or state would offer a unique perspective as it would allow for more educators with varying learning experience backgrounds.

Differences between School A and B

School A teachers are less confident in using technology and find technology less engaging to use than teachers at School B. School A teachers have fewer “tech confident” teachers, 50.00% as compared to 73.91% at School B. At School B, 100.00% of teachers responded that “Yes” to the question, “Overall, would you say that students are more engaged when technology is used in the classroom?” At School A, only 87.50% responded “Yes” to the same question. School A has more computers available to them per student as mentioned in chapter three of this document (See Figure 1) and less LCD projectors available to them per student. School A has a computer to student ratio of 1:2.9 as compared to School B that has a ratio of 1:3.6. School A has a projector to teacher ratio of 1:2.94 and School B has a ratio of 1:2.02. The school with the least number of computers available per student but the most projectors per teacher has more “tech confident” teachers.

Though the teachers at Schools A and B had a very similar range of “tech confidence” scores, School A has a more “tech confident” administrator, as compared to School B. School A’s administrator respondent (Participant A17) received a personal “tech confidence” score of 89.47% and a professional “tech confident” score of 86.84. This is in comparison to School B’s administrator respondents, Participant B25 that had scores of 57.89% for both personal and professional confidence and Participant B26 that had scores of 31.58% for both personal and professional confidence. School A had the lower percentage of “tech confident” teachers though it has the administrator with the greater “tech confidence.” Administrators at School B are strong advocates for the use of technology in the classrooms even though they have a low “tech confidence” score themselves and they have a lower computer to student ratio as compared to School A.

The differences between School A and School B in this research study were minimal. When looking at small details within each aspect of the study, differences can be seen, but in looking at the big picture, School A and School B are quite similar in regard to their teacher confidence, perceptions of student engagement with technology, and professional development and learning experiences.

Recommendations for Policy Change

State

There is a current policy revision in the works in West Virginia to delay purchasing textbooks for two years in order to allow county boards of education to use that funding to improve the technology within their county schools. This policy, “Policy 2445.40 - Groupings for Textbook Adoption for Early Childhood Education, Middle Childhood Education, and Adolescent Education,” if approved, could go a long way to improve the technology resources available to teachers and students in West Virginia. There is no need for new textbooks to be adopted so frequently. That funding could and should be spent in ways that better allow for improved, current and usable technology.

Education Innovation Zones are another way that the West Virginia Department of Education is currently allowing for changes to be made at the school levels. Rule 126CSR75 would allow schools who have been approved through an application process and labeled as an Innovation Zone school to be exempt from some state rules in regard to Education. In addition, schools can receive funding for large scale projects to be completed as part of their Innovation Zone plan.

Currently, teachers only have to be evaluated by their administrator through their fifth year of teaching. Beginning with their sixth year of teaching, they are no longer required to be evaluated or to have a professional growth plan unless they have been deficient in a previous

evaluation. This should change. Teachers should be observed and evaluated yearly.

Technology use is a part of the observation and evaluation forms that are completed by administrators. If a teacher is not using technology in their classrooms, they should be put on an improvement plan for not meeting the diverse learning styles of their students, not just reminded to use more technology. Teachers should have to complete a professional growth plan every two years. Technology should be a large part of the professional growth plan with staff development sessions and integration of content with the technology being a large part of that growth plan.

Policy 5900 (Legislative/Procedural Rule- Chapter 18-2-6, Series 160), the Beginning Educator Internship Program, was developed in 1991 to partner a new teacher with a veteran teacher for the purpose of mentoring within the content area. There should be a similar program called a Technology Internship Program. Teachers with limited proficiency or confidence in technology could be partnered with an experienced technology teacher within their content. This would allow for the sharing of technology skills and integration ideas within the content area. Just as in Policy 5900, teachers in the Technology Internship Program should have common planning times and be compensated for their extra work.

State funding should be made available for hiring Technology Integration Specialists at the county and school levels. In the county where this research was collected, a county-TIS was recently hired but some schools still do not have a TIS on-site. All schools, elementary, middle, and high should have a TIS on-site everyday to help teachers plan and teach lessons as well as to train staff members on both new and old technology to improve their confidence level.

County

Counties should pick up where the state leaves off in regard to funding for school Technology Integration Specialists. Every school should have a Technology Integration

Specialists which would form a county technology committee led by the county TIS. This committee should meet once a month to assist the county in developing policies, purchasing new technologies, planning staff development sessions for teachers, and being consultants for the planning of new buildings.

Though the county has a staff development council that plans the required sessions for teachers in each county, the technology committee should be allowed time for a technology session in which they plan. Teachers need to be given more time to attend such trainings during their normal work day so funds for substitute teachers must be available. Trainings on different levels of need should be made available for teachers to sign up with the session that most helps them at the time.

When buildings are designed and built, educators are often not consulted. The technology committee would be a part of the planning committee, especially in reference to placement and design of computer labs, outlet (electrical and network) placement, screen placement, and so on. Often schools that are built to be technological are designed and built in ways that hinder the use of technology by making it nearly impossible to use due to cords and lack of space, ultimately jeopardizing student safety or simply causing an added frustration to teachers.

School

The school should have a technology committee within the building. This committee would be led by the school Technology Integration Specialist and would meet monthly. The committee would create and continue to add to a compilation of teacher-made lessons and activities in different content areas. These would be shared with the county committee by the TIS and stored in a county file space or webpage that would be accessible to all teachers. These

lessons would be shared and available for easy use for teachers from one classroom and school to the next. Additionally, this committee would help with training of teachers at the school level.

Recommendations for Future Practice

Availability of technology is probably the largest issue. If teachers had it and could have it already set up in their classrooms, many said they would take the time to learn to use it. With availability comes the option of learning and using the technology on a daily basis. Through grant writing and other funding sources, having at least a projector and computer in each classroom should not be an issue. With the most engaging technologies listed on the survey being Internet Explorer and Microsoft PowerPoint, having a computer and projector that could be used for both of those purposes in every class could have a great impact.

Since you cannot simply put technology in every classroom and expect it to be used, training is important. Training opportunities for teachers is of vital importance and will be discussed in the “Recommendations for Preparation of Teachers and Administrators” section.

Current technology or at least usable technology is a must for administrators to get for their school buildings. Government agencies such as the Coast Guard used to and still donate their outdated computers to the schools. More agencies, especially government agencies should be encouraged to do so. Computers in most of these agencies are not more than three or four years old. When they are replaced, if they are cleaned and reformatted, they would make great donations for the schools. Then, computers that are ten or more years old can be removed from use in the schools. Once computers reach a certain age, they are unusable or not worth using because they are more frustrating than helpful. Additionally, more than one person in each building should be able to install hardware and software on the computers to alleviate the struggle or delay of preparing new equipment for use.

Technology use is a requirement on Teacher Evaluations in West Virginia. Teachers should be held accountable for using or at least attempting to learn and use some of the available technologies in their classroom. Just as new teachers in the county are paired with a mentor teacher, teachers who do not feel comfortable using technology should be paired with a technology mentor teacher to guide and help them when necessary and to share integration ideas. If teachers are not willing to try to learn and to try to use some of the technologies in their classroom, they should be put on an improvement plan requiring them to attend training or to work with a technology mentor to feel more confident in using technology with their students.

Marc Prensky (2010) describes what he calls the “Prensky Apostasy” in the book, *Teaching Digital Natives*. He reminds teachers in this chapter of his book that it is the job of the teacher to be the guide, coach, and quality controller when it comes to technology in the classroom, that their job is not to be the user, only occasionally modeling how the technology should/can be used. He says that this should be the case for various forms of technology, allowing students to be the ones to use it. The reason he calls this an apostasy is because it goes away from what he calls the “universal point of view” (p. 101). Prensky explains his apostasy further by saying that “Many think that teachers should use the tools, and many teachers ask for and receive training in their use. But I think it is the wrong way to go” (p. 101). This is key to the future of technology in education. Teachers must see their role in educating with technology and not be afraid to let students take the leadership role at times. In the classroom, all who are present are learners, even the teachers, especially as it pertains to technology.

Recommendations for Preparation of Teachers and Administrators

In schools today, teachers and administrators have a varying range of abilities and confidence levels, especially regarding technology use. Even those straight out of college have

varying technology ability levels as well. Though more of the college requirements are shifting to technology use and integration in the education field, some education students are still graduating without technology confidence.

The wide range of technology ability levels amongst teachers and administrators makes training challenging. Most often, staff development on the school level, whether technology or not, is a requirement for all teachers to attend and is not optional. Having technology school staff development sessions is not the way to go unless there are sessions for varying ability levels or differing technologies that teachers can sign up for to meet their needs/current abilities. The cost of such trainings as well as the technology itself is quite expensive for schools and districts and often is a cause of the lack of such technology.

County professional development sessions have the opportunity to be more beneficial and useful. Summer technology training sessions, possibly week-long sessions, where teachers would have the ability to sign up for classes to learn the technology that they need to or want to learn to use with their classes would be helpful. Teachers or administrators could sign up for a different session each day and could learn up to five different technologies during the week. Ideally, this should be held in August so the ideas are fresh in the teachers' brains when returning to school. If held in June, teachers will have already forgotten what they have learned by the time they return to class in August.

Technology Integration is the most important aspect of technology training. It's one thing to show teachers how to use the technology, but yet another thing to show them or help them to see what they can use it for in their classrooms. This could be done on the county or school level. Simply having a technology sharing time within the school or county where teachers bring technology resources they use in their subject area to share and present to the group of fellow content specific teachers would be very useful. Once teachers see how they

could use the technology or how others have used it, and see that many things are already created and take little or no time to implement into their curriculum, they will be hooked.

In this study it was apparent that many teachers are not prepared to or do not see how to use certain technologies in their classrooms and content area. Programs like Microsoft Excel have an unlimited amount of uses in classes of various content areas and are especially useful in math and science. Teachers in those content areas specifically, need further training on that program, either a class for beginners or a refresher course for those that have experience. Excel is a tool that should be used by all students, especially late elementary school and up. Not only is useful, students enjoy it. They can be creative and express themselves through their graphs and charts. Other technologies such as digital cameras, video cameras, and Windows Movie Maker scored low with confidence results and perceived student engagement. Teachers need to learn to use these technologies because students love them. More staff development is necessary in these areas. Students can express themselves and what they have learned in class in creative ways and are more engaged. Teachers need to learn to use these technologies and utilize them in their classrooms.

Recommendations for Future Research

This research study focused on a limited number of middle school teachers and administrators within one West Virginia county. Studying a larger number of middle school teachers and administrators would offer a better opportunity for comparison and generalization of perceived confidence/ability levels and perceptions of student engagement. More research to help identify patterns such as: which subject area(s) is least likely/more likely to use or see technology as an important tool, to identify if there are subject areas where teachers feel

less/more confident with using technology, and to identify if there is a defining factor to determine confidence in technology use among teachers or administrators.

Completing this study with teachers and administrators of different age groups of students would also add a new perspective. This study focused on middle school teachers and administrators. Adding the elementary and secondary teachers and administrators would add an interesting depth to the study.

Completing the study with schools from different districts would add to the study, particularly in the area of training/preparation. Surveying and interviewing teachers and administrators from different districts, counties or even states, would offer the potential for different professional development trainings to be discussed. Instead, when only researching the two schools in the same county, many educators discussed the same trainings or workshops, without variety.

Talking to the students themselves would offer a great perspective. The students are the ones that truly know if they are more engaged or less engaged with technology in general and with specific technologies. Asking students to complete a Likert scale similar to that the teachers and administrators completed in this study regarding their level of engagement with listed technologies and their confidence with using the technologies would be beneficial. They would be able to share if PowerPoint presentations have gotten boring because they are the new “norm” or if they are still interesting. Additionally, observing students and noting their engagement during different types of lessons with various technologies would add to the current bank of research on this topic. The students have a lot of knowledge and should be asked to share their thoughts and perspectives.

Running a statistical integrity and validating the instrument is a recommendation for future research. Since the survey instrument was researcher created and was only used with a

small sample, this was not possible in this study. With a larger sample size, this could be possible and would be greatly beneficial.

The winter weather impacted the participation in my study. If doing this study again, surveys would be collected at more than one time period, especially after such an extended period away from work for teachers and administrators. This would offer more opportunities to complete and submit surveys and then in turn, possibly volunteer for the follow-up interviews.

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APPENDICES

Appendix A: Teacher Perceptions of Technology Use Survey

You are welcome to complete the online version of this survey at the following website:

<http://simpleforms.scripts.wvu.edu/sf/TeacherPerceptions/>. Either version of this survey should take approximately 15 minutes to complete.

Please return your completed survey to the marked box in the office by Friday, February 5th.

Demographic Information

Mark the answer in each category that best describes you.

Age range

- ☐ 25 and below
☐ 26 to 35
☐ 36 to 45
☐ 46 to 55
☐ 55 and above

☐ Other _____

Gender

- ☐ Male
☐ Female

Years of Teaching Experience

- ☐ 5 and below
☐ 6 to 10
☐ 11 to 15
☐ 16 to 20
☐ 21 to 25
☐ 26 and above

What subject(s) do you currently teach?
 (You may select more than one)

- ☐ Math
☐ Science
☐ Social Studies
☐ Reading/Language Arts
☐ Special Education
☐ Unified Arts
☐ Physical Education/Health

Are you a certified teacher?

- ☐ Yes
☐ No

What degrees have you earned? (List all)

- Undergraduate degree(s): _____

- Graduate degree(s): _____

Do you have children living at home?

- ☐ Yes (If yes, what are the ages of your children?) _____

☐ No

Do you have a computer at home?

- ☐ Yes
☐ No

Do you have Internet access at home?

- ☐ Yes
☐ No

Level of Student Engagement when Teachers and Students Use Technology in the Classroom

Put an “X” in the box that best describes your perception of the engagement of your students when the following technologies are used as pedagogical tools by the teacher or as learning tools by the student.

Technology	Perception of Student Engagement when Technologies are Used as Pedagogical Tools BY THE TEACHER				Perception of Student Engagement when Technologies are Used as Learning Tools BY THE STUDENT			
	Very engaged	Somewhat engaged	Not at all engaged	N/A	Very engaged	Somewhat engaged	Not at all engaged	N/A
Internet Explorer (or other internet web browser)								
Microsoft Word (or other word processing program)								
Microsoft Excel (or other spreadsheet program)								
Microsoft PowerPoint (or other presentation program)								
Microsoft Publisher (or other publishing program)								
Windows Movie Maker (or other movie editing program)								
Google (or other internet search engine)								
Digital camera								
Flip camera (or other digital video camera)								
LCD Projector								
Elmo (or other document presenter)								
Interactive whiteboard								
Wireless slate								
Student response systems								
iPod (or other MP3 player)								

Overall, would you say that students are more engaged when technology is used in the classroom?

- ☐ Yes
☐ No

Explain your reasoning: _____

List any additional forms of technology that you believe engages your students:

Level of Confidence When Teachers Use Technology Tools/Programs

Put an “X” in the box that best describes your confidence level with using each of the listed technology tools/programs. Please mark one “X” for confidence in personal use and one for confidence in professional use.

Technology	PERSONAL USE			PROFESSIONAL USE		
	Very Confident	Somewhat Confident	Not at All Confident	Very Confident	Somewhat Confident	Not at All Confident
Computer						
Email						
Internet Explorer (or other internet web browser)						
Microsoft Word (or other word processing program)						
Microsoft Excel (or other spreadsheet program)						
Microsoft PowerPoint (or other presentation program)						
Microsoft Publisher (or other publishing program)						
Windows Movie Maker (or other movie editing program)						
Social Networking Sites (examples: MySpace, Facebook, Twitter)						
Google (or other internet search engine)						
Digital camera						
Flip camera (or other digital video camera)						
LCD Projector						
Elmo (or other document presenter)						
Interactive whiteboard						
Wireless slate						
Student response systems						
iPod (or other MP3 player)						
Text Messaging (via cell phone)						

Name some factors that attribute to your confidence or lack of confidence with using these examples of technology?

Staff Development/Learning Experiences

Name some of the most beneficial technology staff development sessions that you have attended? Please be specific as to what was taught (programs, hardware, etc.).

Besides staff development sessions, what other technology learning experiences have you had (i.e. university courses, community classes, personal lessons with family or friends)? Please be specific as to what was taught (programs, hardware, etc.) and who (professor, teacher, family, or friend) taught you.

Additional Information

What else would you like to add that has not been addressed in this survey?

If you would be willing to volunteer to be interviewed to provide more information for my study, please provide me with contact information on this page. We are looking for a wide range of ability and confidence levels with technology to get a well-rounded study. This page will be removed from the survey after it is received. Interviews will take approximately 30 minutes and will be scheduled for the most convenient time for you.

Name: _____

Best way to contact:

☐ Phone: _____

☐ Email: _____

Best time/day to schedule interview (on your planning period, before/afterschool, evenings). Please provide me with specific times (example: planning period- 10:00-10:45):

Appendix B: Administrator Perceptions of Technology Use Survey

You are welcome to complete the online version of this survey at the following website:

<http://simpleforms.scripts.wvu.edu/sf/AdministratorPerceptions/>. Either version of this survey should take approximately 15 minutes to complete.

Please return your completed survey to the marked box in the office by Friday, February 5th.

Demographic Information

Mark the answer in each category that best describes you.

Age range

- ☐ 25 and below
- ☐ 26 to 35
- ☐ 36 to 45
- ☐ 46 to 55
- ☐ 55 and above

Gender

- ☐ Male
- ☐ Female

Years of Education Experience

- ☐ 5 and below
- ☐ 6 to 10
- ☐ 11 to 15
- ☐ 16 to 20
- ☐ 21 to 25
- ☐ 26 and above

Are you a certified administrator?

- ☐ Yes
- ☐ No

What degrees have you earned? (List all)

Undergraduate degree(s): _____

Graduate degree(s): _____

Do you have children living at home?

- ☐ Yes (If yes, what are the ages of your children?) _____
- ☐ No

Do you have a computer at home?

- ☐ Yes
- ☐ No

Do you have Internet access at home?

- ☐ Yes
- ☐ No

Administrator Perceptions of Student Engagement Technology in Used in the Classroom

Put an "X" in the box that best describes your perception of the engagement of students when the following technologies are used as pedagogical tools by the teacher or as learning tools by the student.

Technology	Administrator Perception of Student Engagement when Technologies are Used as Pedagogical Tools BY THE TEACHER				Administrator Perception of Student Engagement when Technologies are Used as Learning Tools BY THE STUDENT			
	Very engaged	Somewhat engaged	Not at all engaged	N/A	Very engaged	Somewhat engaged	Not at all engaged	N/A
Internet Explorer (or other internet web browser)								
Microsoft Word (or other word processing program)								
Microsoft Excel (or other spreadsheet program)								
Microsoft PowerPoint (or other presentation program)								
Microsoft Publisher (or other publishing program)								
Windows Movie Maker (or other movie editing program)								
Google (or other internet search engine)								
Digital camera								
Flip camera (or other digital video camera)								
LCD Projector								
Elmo (or other document presenter)								
Interactive whiteboard								
Wireless slate								
Student response systems								
iPod (or other MP3 player)								

Overall, would you say that students are more engaged when technology is used in the classroom?

☐ Yes

☐ No

Explain your reasoning:

Level of Confidence With Technology Tools/Programs

Put an “X” in the box that best describes your confidence level with using each of the listed technology tools/programs. Please mark one “X” for confidence in personal use and one for confidence in professional use.

Technology	PERSONAL USE			PROFESSIONAL USE		
	Very Confident	Somewhat Confident	Not at All Confident	Very Confident	Somewhat Confident	Not at All Confident
Computer						
Email						
Internet Explorer (or other internet web browser)						
Microsoft Word (or other word processing program)						
Microsoft Excel (or other spreadsheet program)						
Microsoft PowerPoint (or other presentation program)						
Microsoft Publisher (or other publishing program)						
Windows Movie Maker (or other movie editing program)						
Social Networking Sites (examples: MySpace, Facebook, Twitter)						
Google (or other internet search engine)						
Digital camera						
Flip camera (or other digital video camera)						
LCD Projector						
Elmo (or other document presenter)						
Interactive whiteboard						
Wireless slate						
Student response systems						
iPod (or other MP3 player)						
Text Messaging (via cell phone)						

Name some factors that attribute to your confidence or lack of confidence with using these examples of technology?

Staff Development/Learning Experiences

Name some of the most beneficial technology staff development sessions that you have attended?
Please be specific as to what was taught (programs, hardware, etc.).

Besides staff development sessions, what other technology learning experiences have you had (i.e. university courses, community classes, personal lessons with family or friends)? Please be specific as to what was taught (programs, hardware, etc.) and who (professor, teacher, family, or friend) taught you.

Additional Information

What else would you like to add that has not been addressed in this survey?

If you would be willing to volunteer to be interviewed to provide more information for my study, please provide me with contact information on this page. We are looking for a wide range of ability and confidence levels with technology to get a well-rounded study. This page will be removed from the survey after it is received. Interviews will take approximately 30 minutes and will be scheduled for the most convenient time for you.

Name: _____

Best way to contact:

☐ Phone: _____

☐ Email: _____

Best time/day to schedule interview (on your planning period, before/afterschool, evenings). Please provide me with specific times (example: planning period- 10:00-10:45):

Appendix C: Teacher Interview Questions

1. How often do you implement technology in your classroom?

Possible Probes:

- Daily, weekly, monthly, etc.?
- Examples of technology might include use of PowerPoint, the Internet, Calculators, etc.

2. What types of professional development opportunities have been made available to you by your school district or your RESA in regard to technology use?

Possible Probes:

- In the trainings, is use of hardware covered as well as software?
- Have any the trainings you have attended included instruction on use of hardware?

3. What other types of learning experiences have you had that have helped you to learn to use available technologies?

Possible Probes:

- Where have you learned such technology outside of the school district/RESA setting (i.e. university courses, community classes, personal trainings with family and friends, etc.)?
- What technologies have you learned and from whom?

4. Do you feel that you are adequately prepared to teach your content using technology?

Possible Probes:

- Explain why or why not.

5. What additional training do you feel would be necessary to prepare you to use technology to teach your content?

Possible Probes:

- Examples: new software, hardware including interactive whiteboards, student response systems, etc.

6. What technology is available for day-to-day use in your classroom?

Possible Probes:

- Do you use this technology daily? Explain why or why not.

7. In your opinion, what types of technology engage students most?

Possible Probes:

- You observe increased student attention/participation
- You observe fewer students off-task

8. What are your perceptions of how educating students has changed through the use of technology?

Possible Probes:

- For enhancing instruction?
- Having resources readily available?
- Academic dishonesty?

9. Do you feel that students are more engaged when technology is used?

Possible Probes:

- Explain
- What observations have you made that support your opinion?

Appendix D: Administrator Interview Questions

1. How often, on average, do your teachers implement technology in their classroom?

Possible Probes:

- Daily, weekly, monthly, etc.?
 - Examples of technology might include use of PowerPoint, the Internet, Calculators, etc.
2. What types of professional development opportunities have been made available to you by your school district or your RESA in regard to technology use?

Possible Probes:

- In the trainings, is use of hardware covered as well as software?
 - Have any the trainings you have attended included instruction on use of hardware?
3. What other types of learning experiences have you had that have helped you to learn to use available technologies?

Possible Probes:

- Where have you learned such technology outside of the school district/RESA setting (i.e. university courses, community classes, personal trainings with family and friends, etc.)?
 - What technologies have you learned and from whom?
4. What types of professional development opportunities have been made available to your teachers by your school district or your RESA in regard to technology use?

Possible Probes:

- In the trainings, is use of hardware covered as well as software?
 - Have any the trainings you or your teachers have attended included instruction on use of hardware?
5. What additional training do you feel would be required to make your teachers feel prepared to use technology to teach their content?

Possible Probes:

- Examples: new software, hardware including interactive whiteboards, student response systems, etc.

6. What technology is available for your teachers to use in your school building?

Possible Probes:

- Number of computer labs (number of computers in each), projectors, interactive whiteboards, etc.
- Do a majority of your teachers utilize the available technology? Why or why not?

7. Name some examples of technology used in your teachers' classrooms on a regular basis.

Possible Probes:

- Computer labs, interactive whiteboards, projectors, student response systems, etc.

8. What are your perceptions of how educating students has changed through the use of technology?

Possible Probes:

- For enhancing instruction?
- Having resources readily available?
- Academic dishonesty?

9. Do you feel that students are more engaged when technology is used?

Possible Probes:

- Explain
- What observations have you made that support your opinion?

Appendix E: Summary of Interview Transcripts- School A Teachers

SCHOOL CODE PARTICIPANT CODE	QUESTION 1 RESPONSES: <i>(How often do you implement technology in your classroom? List technologies and frequency (daily, weekly, etc.)</i>
A1	Prepare lessons/find more current info for lessons or lesson ideas- regular basis Limited students use of technology (one desktop computer)- used for simulation games in free time, Edline checks, or finishing Writing Roadmap before homeroom or 8 th period Had a difficult time with assigned internet research project- poor search skills, difficulty finding appropriate sources Acuity benchmarks (mandated)= 2 completed so far TechSteps- will complete
A2	Graphing calculators- biweekly with Algebra students Elmo- several times a year
A3	Utilize instructional technology everyday every class period Daily- PowerPoint presentation, Microsoft Word, grammar games, online textbook, Edline updates for homework Weekly- Edline updates for grades, assignment drops in Edline for students, video streams, classchatter.com, CPS class assessments Monthly/Quarterly: Podcasts, FlipVideo, Audacity, extended video clips for comprehension Interactive Whiteboard in classroom- will be used March to June
A4	Use technology 3-5 times a month: PowerPoint presentations to give notes TechSteps project- PowerPoint with pictures and sound- once a year Writing Roadmap- 2-3 times a month Requires essays to be typed using Microsoft Word Pictures and video from Internet using LCD projector for writing prompts and short writing assignments “WebBased Treasure Hunts” to find and cite information pertaining to topic Posting grades and assignments online
A15*	Implement technology 3-5 days a week: LCD projector and laptop to show verb/grammar activities associated with textbook Use websites for verb practice Textbook DVD program and download audio activities from textbook website instead of using CDs Daily: preparing lesson plans, developing activities to keep attendance/grades, email parents, etc Computer lab visits as a class- about 5 times a year
A16*	Use technology daily in Read 180 Classroom- students use computers to access Read 180 software geared to individual reading levels, uses Reading Counts quizzes as well
SCHOOL CODE	QUESTION 2 RESPONSES: <i>What types of professional development opportunities have been made</i>

PARTICIPANT CODE	<i>available to you by your school district or your RESA in regard to technology use?</i>
A1	TechSteps training (county level) Student Response Systems (school level) Technology Integration (county level- taught by teachers) Social Studies Institute (state level- summer)
A2	TechSteps (county level)
A3	Edline (school level) WVDE tools (county level)
A4	TechSteps (county level)
A15*	WV Teacher Leadership Institute (state level- summer)
A16*	WV Special Education Teacher Leadership Institute (state level- summer)

SCHOOL CODE PARTICIPANT CODE	QUESTION 3 RESPONSES: <i>What other types of learning experiences have you had that have helped you to learn to use available technologies (technology learned from university courses, community classes, personal trainings with family and friends, etc.)?</i>
A1	Don't know of any classes
A2	Governor's Academy of Math, Science, and Technology (4 weeks) during summer of 1993- Texas Instruments graphing calculator and programming Loyola College- Sharp Calculator seminar (weekend)- calculators and programming- TI-81 Refresher Algebra course (2009)- tied to TI-84
A3	Major strain in initial certification program (specific technology projects for each course and online portfolio requirement) Additional certificate program through IViN courses and eCampus as well as electronic portfolio Husband- personal technology guru- teaches online course for university- finds shortcuts and creates little programs to use in the classroom and when completing certificate
A4	Two graduate level education classes on technology
A15*	"I usually have no fear to try to learn how to use new technology on my own. Most of my learning experiences have come from self-teaching."
A16*	"I have learned about using technology from colleagues in school and on my personal time (this is the primary way I have learned about technology.)"

SCHOOL CODE PARTICIPANT CODE	QUESTION 4 RESPONSES: <i>Do you feel that you are adequately prepared to teach your content using technology? Explain why or why not.</i>
A1	"I definitely feel prepared. I am comfortable picking up and using almost new software. Most of the time, I think it's intuitive. I also look for anything that will make my job (especially the paperwork management!) easier. The hardest issue for me right now is that the resources are not readily available. Right now, I don't even know where the student response system is. I don't have a laptop to easily hook to a projector; I do not have a whiteboard, etc. When the

	items are not utilized on a regular basis, the enthusiasm fades because I do not want to struggle or hassle with sharing materials or scheduling times to use the stuff. I also do not have the expendable income to just go and buy my own. I am frustrated at this point since I feel like I'm falling behind."
A2	"No, but if I had a smart board, I would teach myself how to use it, because when I took a refresher class in High School Geometry, the teacher used the smart board, and I saw all kinds of possibilities with the graphing feature, its memory for problems taught. It was awesome, when it worked, but I could still cope if it went down, because, I have not exclusively lived with technology."
A3	"Yes. I am a digital native so even if I am unfamiliar with a technology, I dive right in and play with it until I can apply it to something that will benefit my students. It is actually faster for me to create electronic activities than the paper ones."
A4	"Yes, but not necessarily through the board of education. Because I use technology on a regular basis outside of school, I feel comfortable implementing in the classroom."
A15*	"Yes, I feel prepared. I have no trouble trying to figure out things on my own. As long as it is available, I will use it. I definitely use it more now that I have my own equipment. I used to have to borrow laptop/projector from the library."
A16*	"I feel that I am adequately prepared to teach my content using technology, however, some of the ideas that have been mentioned in seminars which I would like to use can't be used due to conflicts with district technology restrictions."

SCHOOL CODE PARTICIPANT CODE	QUESTION 5 RESPONSES: <i>What additional training do you feel would be necessary to prepare you to use technology to teach your content?</i>
A1	"I would simply like to be able to use more technology on a regular basis AND have enough to give my students more exposure/familiarity. iTunes and Facebook/Myspace are not enough."
A2	"If computer training were advanced to help teach my subject matter to students, I would take the courses offered, but, I would have a problem with access to the computers in the building. There are too many mandatory requirements in Middle School that make it almost impossible to get a computer lab more than 1 day."
A3	"I would love to find a great technology training focusing on instructional technology in a WL classroom! Any new tricks, toys, games and tools that would get the kids excited would be great."
A4	"I'm good! Training bores me."
A15*	"I don't feel that I need additional training; however, I would like to have more access to technology."
A16*	"I would like training implementing and using white boards."

SCHOOL CODE PARTICIPANT CODE	QUESTION 6 RESPONSES: <i>What technology is available for day-to-day use in your classroom? Do you use this technology? Explain why or why not.</i>
A1	One desktop computer One tv and dvd/vcr (“which I think is dying”)
A2	Graphing calculators (“but their use is not always appropriate”)
A3	Laptop and projector (receive through textbook adoption) Online texts for teacher and students
A4	LCD projector Laptop Computer lab
A15*	3 computers (2 desktop and 1 laptop)- use 1 desktop and laptop nearly everyday LCD projector- use daily Classroom performance system (clickers)- haven’t used because just received it and needs Deep Freeze removed to install the software to use it “I use the technology every day because my instructional materials that I received have great technology that helps my students to see what they are learning from a different perspective. My students also like to interact with the various programs that the technology has to offer.”
A16*	TV/DVD- about once week Overhead projector- about once week LCD Projector- about once week Computers- daily CD players (for audio books)- about once week

SCHOOL CODE PARTICIPANT CODE	QUESTION 7 RESPONSES: <i>In your opinion, what types of technology engage students most? What have you observed that led to this opinion?</i>
A1	“I think any type of technology that has FUN applications is most engaging.” Making PowerPoint presentations once you begin adding effects Moviemaker- it can be highly personalized and unique “It is not fun to sit in front of a monitor answering multiple choice questions, nor is it fun to sit and just type an essay. That is not engagement in my opinion. I feel that much of the time we have available in our labs is eaten up by drudgery.”
A2	Smartboards- seeing kids attention drawn to the colors and movement on the board. iPhones and other cell phones “Well if you walk around throughout the day in the school, many teachers have their heads buried in their cell phone, checking email, etc., then after school, the kids are nose down going out the door, with their cell phone.”
A3	Question/responses systems Flip videos Option to download notes and homework as well as exam study guides from

	Edline (absent students) (Above answers "Based on classroom student response")
A4	Internet PowerPoint "Students who usually seem disengaged will do better on these type of assignments (ones that require the Internet and PowerPoint)."
A15*	Cell phones (and downloaded applications that can help them- ex. App at home to help them translate their Spanish homework) iPods/MP3 players (anything associated with music or app to convert dollars to Euros) (Above answers from informal discussion with students)
A16*	"Using the computers, no matter what type of assignment, engages the students the most. Students are on task when using the computers and there tends to be no behavioral issues when the students are using the computers."

SCHOOL CODE PARTICIPANT CODE	QUESTION 8 RESPONSES: <i>What are your perceptions of how educating students has changed through the use of technology (i.e. enhancing instruction, having resources readily available, academic dishonesty, etc.)?</i>
A1	"I think academic dishonesty is a definite issue. The number of plagiarized essays is unreal. I also have worried before about texting during class on test days, etc. I am not so concerned about that now. I still believe technology could be used to make education more individualized and pertinent. I really like the idea of being able to have a blog or webpage where students could post or share comments about readings/assignments, etc. I would really like to be able to assign the reading of a blog or website for homework even, or have students create their own pages for my class. Many things could make learning and teaching easier, but for me, it doesn't seem to be working out that way."
A2	"I felt the perception of "Academic Dishonesty" when I took an online course. This occurred whenever I had to have an administrator at my school sign off that I was taking the Final in his office."
A3	"My students are such multi-taskers that it is almost punitive to have 1 presentational method or assessment method and to make everything paper based. I wish we had school sets of iPods to let the kids listen to music as they complete group activities and assessments. This way I would know what is on them. I am not a supporter of allowing students to use their personal music players because it is so easy to create tracks that have the answers and rename them. I would also like for the county policy to be adjusted to allow students to take notes and submit assignments via smartphones and iPods. I do some of my grading and most of my emails from my phone and it is something I think the kids would use. (I could go on for pages here)."
A4	"Plagiarism is more prevalent. They cut and paste their work. Homework is also cut and pasted. They email homework answers to each other. Parents seem more involved when grades and assignments are posted. They seem to appreciate the instant feedback on their child's progress. Technology is certainly more fun for me. It breaks up the monotony of bookwork and gives something to which both the students and I can look forward. Supplemental

	worksheets that are on CD's are easily accessible to me both at home and at school. There is a wealth of material at my fingertips."
A15*	"Education has changed drastically through the use of technology. Nowadays, information is instantly obtained. Students no longer have to search through extensive databases or books to locate what they are looking for. In some ways, this is a positive aspect of technology. Students don't have to spend a lot of time searching for things. Negatively, students may encounter false or misleading information that they obtain instantly through the use of technology. Unfortunately, students also have the opportunity to plagiarize work using technology. It's quite easy to cut and paste large pieces of information. My instruction has definitely been enhanced with the use of technology. It's so easy to keep lesson plans to date by typing them. It's also easy to correspond with parents via email. I enjoy using technology as a teaching tool as well. Students love to interact with computer programs that can individually pace/assist them in their learning."
A16*	"Instruction has become less worksheet oriented and has become more oriented on having students produce products that show what they learn. Using technology has contributed to academic dishonesty, especially in writing essays and papers. Also, with the use of technology, students can find information on any subject, but that information may not be the most reliable information."

SCHOOL CODE PARTICIPANT CODE	QUESTION 9 RESPONSES: <i>Do you feel that students are more engaged when technology is used? Explain.</i>
A1	"Again, if it's fun for them, yes. However, I have seen students with glazed eyes while using powerpoint almost as much as I've had to shush them because of their excitement. The glazed eyes tend to come from students who are not as prepared with their research or not as comfortable in general with computers. Most students love to create projects, and using a program makes it easier to share their creations. Plus, many students who cannot draw well or write neatly get to make something they can be happy with since they can easily snag pictures from clipart or a website and type in their info. For some students, the novel experience itself of learning something new is engaging as well."
A2	"My students like to go like to go to the text section of the Graphing Calculator, or try the Probability trials, when they are suppose to be using the calculator to find the Area of a circle using the formula. The extra features are nice, and necessary, but can take kids' focus off what they are studying."
A3	"Absolutely! They are surrounded by 40 kinds of technology everyday... until they get to school. By implementing anything that is technology based it triggers something in the students and you can physically see them straighten and their eyes focus more intently on what is going on. We are finishing a chapter about computer and technology in French II and the students are totally focused. They want to know more about things like myspace, facebook and twitter as well as texting lingo. They loved a short lesson that showed

	them how to “text” phrases in French. (For example, “quoi de neuf? is What’s new? is Ka d9?”)
A4	“I think they are, because they feel that technology adds an element to school to which they can relate. They get excited that their teachers are doing something in the classroom that they do at home with their friends.”
A15*	“Yes. Students are comfortable using technology and it is now part of their daily lives. To them, having class without it seems obsolete/out of place. Nowadays, they expect it, and it is their preferred method of acquiring knowledge.”
A16*	“On the whole, I feel that students are more engaged when technology is used because it’s something that the students have grown up with. I feel that it would be nice to have student email accounts so that students could email assignments to me even during the school day.”

Appendix F: Summary of Interview Transcripts- School B Teachers

SCHOOL CODE PARTICIPANT CODE	QUESTION 1 RESPONSES: <i>(How often do you implement technology in your classroom? List technologies and frequency (daily, weekly, etc.)</i>
B1	Daily- use PowerPoint to inform students of bell-ringer and materials needed for day
B4	<p>"I am pretty bad about implementing technology, simply because I do not have all of the resources readily available. I use an overhead projector (if that even counts!) at least once every two weeks."</p> <p>Students typed papers in computer labs 3times this year, several days in lab each time</p> <p>Have used a projector several times this year to help students with writing and show PowerPoints</p> <p>4th Nine Weeks- students will create their own PowerPoint</p> <p>Students will be in computer lab researching on the Internet for the next several weeks</p>
B5	<p>Implement technology weekly with students</p> <p>Twice a week- use internet and projector to take a quiz or go over a PowerPoint</p> <p>Students go to computer lab frequently to create own PowerPoint or practice for Writing Roadmap</p>
B7	<p>Almost Daily- use laptop and LCD projector</p> <p>Several times a week- use Elmo</p> <p>2-3 times a year use TV to show videos</p> <p>Overhead projector to use if LCD projector is inoperable</p>
B10	<p>Daily- some type of technology</p> <p>Interactive whiteboard- twice a week</p> <p>Elmo- days when not using Interactive whiteboard (about 2-3 times a week)</p>

SCHOOL CODE PARTICIPANT CODE	QUESTION 2 RESPONSES: <i>What types of professional development opportunities have been made available to you by your school district or your RESA in regard to technology use?</i>
B1	Technology Integration (county level- taught by teachers)
B4	Acuity (school level)
B5	TechSteps (county level)
B7	<p>Technology Integration (county level- taught by teachers)</p> <p>Technology Integration - Online class (state level)</p>
B10	<p>Project METTS (Mathematics Education Through Teacher Support)- grant funded program</p> <p>Technology Integration (county level- taught by teachers)</p> <p>Various other WV Department of Education workshops</p> <p>TechSteps (county level)</p> <p>Acuity (county and state level)</p>

SCHOOL CODE PARTICIPANT CODE	QUESTION 3 RESPONSES: <i>What other types of learning experiences have you had that have helped you to learn to use available technologies (technology learned from university courses, community classes, personal trainings with family and friends, etc.)?</i>
B1	Not answered
B4	College class- learned kid-friendly programs like KidPix and how to use WebQuests. “I was better at using technology when I taught at the elementary level.” When teaching in Texas, great deal of Macintosh laptop training because all students grades 6 and up and teachers had one
B5	High school course- learned a lot about Microsoft Word, Excel, and PowerPoint University courses- had to implement those programs Parents- taught different things about the programs
B7	“All the technology that I use I learned how to use mainly from other people or from playing with it myself.”
B10	WVDE- how to use movie camera and how to make movies While trained as online Professional Development Facilitator- learned how make blogs and wikis Sons- taught how to use some things on phone and some word processing on computer Tech teacher (TSI) helps at school

SCHOOL CODE PARTICIPANT CODE	QUESTION 4 RESPONSES: <i>Do you feel that you are adequately prepared to teach your content using technology? Explain why or why not.</i>
B1	“I would feel more comfortable having more training, especially since I am in a room full of computers each day. I suppose I have enough for my content area.”
B4	“Not really- I am not sure how to use technology to teach beyond using Microsoft Word, the Internet, Power Point, and the basics. I would be willing to do more if I had more help or training.”
B5	“I do. I feel that I am adequately prepared for teaching with technology. I feel if teachers have an open mind about technology, it can be extremely beneficial in the classroom.”
B7	“Yes. I create PowerPoint presentations and Windows Media movies for content. I use Word to write their thoughts so they can see them. I use the Elmo to go over work or to model what I want them to do. I allow them to put examples on the Elmo. When something is projected on the whiteboard, I’ll have students come up to identify things we’re learning about.”
B10	“Yes, because I am constantly finding sites to use and Power Points to show that cover content.”

SCHOOL CODE PARTICIPANT CODE	QUESTION 5 RESPONSES: <i>What additional training do you feel would be necessary to prepare you to use technology to teach your content?</i>
B1	“troubleshooting”
B4	“Not really. I am not sure how to use technology to teach beyond using Microsoft Word, the Internet, PowerPoint, and the basics. I would be willing to do more if I had more help or training.”
B5	“Unfortunately, with the size of our school and the limited resources it is difficult to have the students use technology. I can use technology in my class with the projector and Internet, but only have two other PCs. I can sometimes use an Elmo machine which I have had training on through peers.”
B7	“It would be nice to get some in-depth training on the clickers (we have some available for use) and the interactive whiteboards (there are a couple available). These items would be good for more student interaction with technology and hopefully would keep them involved and on target.”
B10	“I am not really ready to use my Flip camera and also the digital cameras or cell phones.”

SCHOOL CODE PARTICIPANT CODE	QUESTION 6 RESPONSES: <i>What technology is available for day-to-day use in your classroom? Do you use this technology? Explain why or why not.</i>
B1	Computer lab
B4	3 computers in classroom- teacher uses one daily for email, attendance, and entering grades; students use other 2 computers Overhead projector LCD Projector (available for checkout from library) for PowerPoints
B5	Projector, Laptop, Internet- not every day, but at least once a week “I don’t feel it is necessary to use these on a daily basis. Students are doing a lot of writing, and in most cases feel it is good for them to write using a pencil and paper, therefore technology is not really needed.”
B7	Laptop, LCD projector, Elmo- used daily or weekly Interactive whiteboard and clickers can be checked out TV
B10	Elmo Interactive Whiteboard LCD Projector Wireless slate Laptop Desktop computer Digital cameras Flip camera

SCHOOL CODE PARTICIPANT CODE	QUESTION 7 RESPONSES: <i>In your opinion, what types of technology engage students most? What have you observed that led to this opinion?</i>
B1	Interactive games “My students finish the assignments as soon as they can so they can play the typing games.”
B4	“Technology in which they must actually do something and participate (engage them most).” WebQuests (Scavenger hunt- type activities) Online games (tutorials)
B5	“I feel students like technology that they can use easily. PowerPoint seems to be one that students are engaged in. Any technology in which students can be creative and express themselves, they seem to enjoy.”
B7	Windows Media Player, PowerPoint (require interaction) Elmo to model activities
B10	Interactive whiteboard Classroom performance system (clickers) Visuals and games that can be played

SCHOOL CODE PARTICIPANT CODE	QUESTION 8 RESPONSES: <i>What are your perceptions of how educating students has changed through the use of technology (i.e. enhancing instruction, having resources readily available, academic dishonesty, etc.)?</i>
B1	“Technology enhances instruction because of the video games the students are used to playing. We had a teacher several years ago who video taped himself teaching and the students were more attentive to the video than if he had been teaching live. Search engines are very handy to look up information quickly so the students can have answers quickly.”
B4	“I think it has greatly helped, but it has also caused teachers to have to focus more on teaching about finding quality resources on the internet.”
B5	“I feel research is a lot easier than it used to be. With the Internet, and online databases, students can find resources easier than they used to with books and encyclopedias like they used to. I also feel students are "copy and pasting" a lot of information as well, instead of writing in their own words. It seems there are many games to play and different tools online that are available to students today, that hadn't been growing up in our generation.”
B7	“I believe that because of technology they are more likely to not do worksheets or homework because it's not “fun”. They are too focused on having fun in the classroom and using the latest gadgets. Using the latest technology does not mean that the student is learning the content even if the content is being taught with the technology. Students are lazier when it comes to collecting or extracting information. They are quite willing to copy information from the internet and claim it for their own.”
B10	“Technology has enhanced education to the extent that information can be discovered quickly. Concepts can be seen which helps increase understanding. Technology has also caused some problems. Students want constant stimulation

	and entertainment. Also students trust almost everything they see on the web and must be taught to check facts rather than just take what they read as truth. Academic dishonesty has increased because info is so easily found and can be incorporated into their work.”
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SCHOOL CODE PARTICIPANT CODE	QUESTION 9 RESPONSES: <i>Do you feel that students are more engaged when technology is used? Explain.</i>
B1	“Because of the video generation, students are more attentive to a screen and animation than my generation. When I first started teaching, we were happy to show filmstrips and the students thought that was a real treat.”
B4	“Yes, especially since I do not use it often. It is something different rather than them having to constantly listen to my voice.”
B5	“I feel if the teacher is using the technology efficiently or can guide the students successfully, then they are more engaged. However, some students don't prefer using technology. Some students just like adults, refuse to acquaint themselves with technology and would rather use pencil and paper to learn.”
B7	“Again, engaged does not mean learning. Yes, students are more engaged when you use technology because that is their way of life. They watch TV, play video games, text, Facebook, use iPod's and MP3 players every day. Their attention span is short and they expect to be entertained. They will pay attention when you use technology, but learning comes from practice and that they don't want to do.”
B10	“Students are more engaged when technology is used. But as with anything else they later become bored with it too and only perk up when something total new comes along. They will have more conversations about what they see or do with technology, especially if it is something new.”

Appendix G: Summary of Interview Transcripts- School A Administrator

SCHOOL CODE PARTICIPANT CODE	QUESTION 1 RESPONSES: <i>(How, on average, do your teachers implement technology in their classroom? List technologies and frequency (daily, weekly, etc.)</i>
A17	Varies by teacher. Some use daily Others once or twice a week Some infrequently (only when going to the computer lab or required by Writing Assessment) Teachers seem to use the Elmo frequently Each team has an interactive whiteboard All language teachers complete at least 4 Writing Roadmaps per year (many go as much as once a month to complete an essay) Each team completes 3 TechSteps lessons' Three computer labs are filled for use everyday Some teachers use flip cameras in classroom

SCHOOL CODE PARTICIPANT CODE	QUESTION 2 RESPONSES: <i>What types of professional development opportunities have been made available to you by your school district or your RESA in regard to technology use?</i>
A17	Update on technology during administrator meetings and instructional meetings (15-20 minute sessions on things to take back to schools- ex. Lexiles, web streaming, etc.)

SCHOOL CODE PARTICIPANT CODE	QUESTION 3 RESPONSES: <i>What other types of learning experiences have you had that have helped you to learn to use available technologies (technology learned from university courses, community classes, personal trainings with family and friends, etc.)?</i>
A17	"I have just taken the initiative to learn how to use technology on my own." Dave Kinney (county BOE technology contact) or a teacher if have question "Primarily, I am self-taught."

SCHOOL CODE PARTICIPANT CODE	QUESTION 4 RESPONSES: <i>What types of professional development opportunities have been made available to your teachers by your school district or your RESA in regard to technology use?</i>
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A17	<p>TechSteps training</p> <p>“I can’t think of many that focus solely on technology and how to utilize in your classroom.”</p> <p>Computer lab aide shows teachers programs that she feels teachers could use in their classrooms.</p>
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SCHOOL CODE PARTICIPANT CODE	QUESTION 5 RESPONSES: <i>What additional training do you feel would be required to make your teachers feel more prepared to use technology to teach their content?</i>
A17	<p>Some type of accountability- need to use technology a certain percentage of the time and must document its usage.</p> <p>County should offer classes on technology during the summer and on IS (Instructional Support) days</p> <p>It would be up to the teacher to sign up for training he or she would like to learn</p>

SCHOOL CODE PARTICIPANT CODE	QUESTION 6 RESPONSES: <i>What technology is available for your teachers to use in your school building? Do a majority of your teachers utilize the available technology? Why or why not?</i>
A17	<p>Varies by teacher.</p> <p>Some use daily</p> <p>Others once or twice a week</p> <p>Some infrequently (only when going to the computer lab or required by Writing Assessment)</p> <p>Teachers seem to use the Elmo frequently</p> <p>Each team has an interactive whiteboard</p> <p>All language teachers complete at least 4 Writing Roadmaps per year (many go as much as once a month to complete an essay)</p> <p>Each team completes 3 TechSteps lessons’</p> <p>Three computer labs are filled for use everyday</p> <p>Some teachers use flip cameras in classroom</p>

SCHOOL CODE PARTICIPANT CODE	QUESTION 7 RESPONSES: <i>Name some examples of technology used in your teachers’ classrooms on a regular basis.</i>
A17	<p>Elmo</p> <p>Interactive whiteboard</p> <p>Overhead</p> <p>TV/DVD</p> <p>Quizzards (clickers)</p> <p>Flip cameras</p> <p>iPods</p>

SCHOOL CODE PARTICIPANT CODE	QUESTION 8 RESPONSES: <i>What are your perceptions of how educating students has changed through the use of technology (i.e. enhancing instruction, having resources readily available, academic dishonesty, etc.)?</i>
A17	“We are at a point where teachers are beginning to see the importance of using the technologies that students enjoy working with. Many teachers do not know how to use ipod (podcasts), cell phones in the classroom. Plus though many students have these items – some students do not. Schools are trying to keep up with computer updates and many do not have classroom sets of ipods, etc. Some teachers are using teacher tube, united streaming etc... to provide support to the content that is found in textbooks. Our librarian and many language arts teachers are trying to teach students about copyright laws and checking facts found on websites. In my opinion this needs to start at a younger age in elementary school.”

SCHOOL CODE PARTICIPANT CODE	QUESTION 9 RESPONSES: <i>Do you feel that students are more engaged when technology is used? Explain.</i>
A17	“I believe that student engagement relies primarily on the teacher. There are charismatic teachers who can engage students using NO technology at all. Then there are mediocre teachers who can enhance their classroom and create long term learning and student engagement using technology. To truly prepare students for the future – I believe that the answer is finding middle ground and using technology as an important part of everyday classroom.”

Appendix H: Summary of Interview Transcripts- School B Administrators

SCHOOL CODE PARTICIPANT CODE	QUESTION 1 RESPONSES: <i>(How, on average, do your teachers implement technology in their classroom? List technologies and frequency (daily, weekly, etc.)</i>
B25	About 30% of teachers use technology daily About 30% use it 2-3 times a week About 40% rarely use technology- less than once every other week
B26	Daily- computers, LCD projectors, Dance Dance Revolution Weekly- Elmo, TV/VCR/DVD, cassettes, whiteboards (rooms that have them), calculators Monthly- personal responders

SCHOOL CODE PARTICIPANT CODE	QUESTION 2 RESPONSES: <i>What types of professional development opportunities have been made available to you by your school district or your RESA in regard to technology use?</i>
B25	Trainings to access testing PowerPoints, testing data disaggregation, Walkthroughs using Palms, Palm/HP Applications, Acuity, etc.
B26	Interactive Whiteboard Training Elmo Training

SCHOOL CODE PARTICIPANT CODE	QUESTION 3 RESPONSES: <i>What types of professional development opportunities have been made available to you by your school district or your RESA in regard to technology use?</i>
B25	"I learn best in a small group or one on one where I can ask questions immediately. I can follow directions for technology implementation but it doesn't go as well."
B26	"Most of my training has via personal usage (self taught) or by a family member. School tech will provide training as needed."

SCHOOL CODE PARTICIPANT CODE	QUESTION 4 RESPONSES: <i>What types of professional development opportunities have been made available to your teachers by your school district or your RESA in regard to technology use?</i>
B25	Acuity Edline IEP training ("very poor online package with lots of glitches") Many others

B26	Not answered
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SCHOOL CODE PARTICIPANT CODE	QUESTION 5 RESPONSES: <i>What additional training do you feel would be required to make your teachers feel more prepared to use technology to teach their content?</i>
B25	Training for RTI materials Time to use online searches to download RTI Evaluations Continued support for IEP programs
B26	“District should allow time for school’s tech person to train or retrain teachers in available technology. Teachers need hands on training to feel comfortable enough to use it in their lessons.”

SCHOOL CODE PARTICIPANT CODE	QUESTION 6 RESPONSES: <i>What technology is available for your teachers to use in your school building? Do a majority of your teachers utilize the available technology? Why or why not?</i>
B25	Interactive whiteboards Laptops Projectors Elmos Direct connections to TV from classroom laptops for PowerPoints “About 60% utilize the technology fairly regularly. Teachers who don’t are due to comfort level and familiarity.: I think there is a group of teachers who just hope to outlast the wave of technology and only do what they need to do to keep their heads above water. Anything too complicated, they use teammates to do the technology for them like an immigrant may use someone else to translate a new language instead of working to learn it themselves.”
B26	Computers Laptops Elmos Interactive whiteboards LCD projectors Overheads TV Disc players Personal responders “A majority of our teachers use the basics: Computer, laptops, projectors, tv, overheads, because they are familiar with them and have been using them for a long time. They probably don’t use new technologies because they haven’t had extensive training with them. We need to provide extra hands on training

	to make technologies more user friendly for the older generation of teachers.”
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SCHOOL CODE PARTICIPANT CODE	QUESTION 7 RESPONSES: <i>Name some examples of technology used in your teachers’ classrooms on a regular basis.</i>
B25	Interactive whiteboards Laptops Projectors Elmos Direct connections to tv from classroom laptops for PowerPoints
B26	Computers Projectors Overheads Cassettes TV

SCHOOL CODE PARTICIPANT CODE	QUESTION 8 RESPONSES: <i>What are your perceptions of how educating students has changed through the use of technology (i.e. enhancing instruction, having resources readily available, academic dishonesty, etc.)?</i>
B25	“I think that technology has placed information at our children fingertips with iPhones, iTouches etc. I wonder if they soon will know how to do an info. search in a library and if that is as relevant as it once was.”
B26	“Instruction is enhances through use of technology; but we as educators need to keep on the cutting edge. Our students have grown up with them and are used to immediate feedback. This is a problem teachers need to address, we need to develop lessons that are high interest and keep students engaged.”

SCHOOL CODE PARTICIPANT CODE	QUESTION 9 RESPONSES:
B25	“Yes, absolutely. It plays to their language and comfort zone.”
B26	“Yes, for the simple reason they cannot sit and just listen anymore. They have to be engaged in order to learn. The more ways we involve our students the better.”

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Education:	Doctorate of Education in Curriculum & Instruction West Virginia University, Morgantown, WV	December 2010
	Master of Arts in Elementary Education The Benedum Collaborative Model of Teacher Education West Virginia University, Morgantown, WV	May 2002
	Bachelor of Arts in Multi-Disciplinary Studies West Virginia University, Morgantown, WV	May 2002

Certification:	Current West Virginia Certification in: <ul style="list-style-type: none"> • Elementary Education, Grades K-6 • General Science, Grades 5-9 • Mathematics, Grades 5-9
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Career-Related Experience:	Science Teacher Spring Mills Middle School, Martinsburg, WV <ul style="list-style-type: none"> • Plan and implement curriculum for seventh and eighth grade science courses • Work collaboratively with teachers in a team setting • Supervise children in classroom and social settings 	Fall 2008 to present
	Math Teacher Spring Mills Middle School, Martinsburg, WV <ul style="list-style-type: none"> • Plan and implement curriculum for sixth, seventh, and eighth grade math courses (Math 6, Math 7, Pre-Algebra, Geometry) • Work collaboratively with teachers in a team setting • Supervise children in classroom and social settings 	Fall 2004 to Spring 2008
	Adjunct Professor, C&I 689 (2 semesters) West Virginia University, Morgantown, WV <ul style="list-style-type: none"> • Plan and implement curriculum for graduate level students in C&I 689 (Classroom Management) course. • Work collaboratively with other professors in a team setting. • Teach graduate students a variety of classroom management concepts related to current research and their individual experiences 	Summer 2006 to Fall 2006
	Math Teacher Hedgesville Middle School, Hedgesville, WV <ul style="list-style-type: none"> • Plan and implement curriculum for seventh and eighth grade math courses (Math 7, Pre-Algebra, Algebra) • Work collaboratively with teachers in a team setting • Supervise children in classroom and social settings 	Fall 2002 to Spring 2004

**Presentation
Experience:****National Level**

National Middle School Association Conference

- “Who Are They? Do You Know Who You Are Teaching?” Denver, CO Fall 2008
- “Got Technology? Your Students Do!” Houston, TX Fall 2007

State Level

WV Reading Research Symposium

- “Building a Culture of Literacy” Charleston, WV Spring 2009

WV State Social Studies Conference

- “Mini Society” Charleston, WV Summer 2007

WV State Science Teachers Conference

- “Space Academy for Educators” Morgantown, WV Fall 2004

County Level

Berkeley County School Assistance Team Meeting

- “Using the Wii Remote in the Classroom” Martinsburg, WV Fall 2008

Berkeley County Staff Development

- “Technology Integration for Middle School Teachers” Martinsburg, WV Spring 2008

School Level

Spring Mills Middle School

- “*Differentiated Instruction*: Book Study” Spring 2009
- “Using the Wii Remote in the Classroom” Fall 2008
- “GradeQuick/EdLine Technology Training” Fall 2008
- “GradeQuick/Homework Hero Technology Training” Spring 2009
- “Differentiated Instruction” Fall 2007

**Awards/
Recognition:**

Berkeley County Teacher of the Year Finalist

Fall 2008

West Virginia Teacher Leadership Institute Participant

Summer 2008 to present

Project M.E.T.T.S. Grant/Research Participant

Fall 2007 to present

Honeywell Scholarship- Space Academy for Educators II

Summer 2005

Honeywell Scholarship - Space Academy for Educators I

Summer 2004

**Technology
Skills:**

Windows, Microsoft (Word, Excel, FrontPage, Publisher, PowerPoint, Internet Explorer), MediaShout, Adobe Acrobat, Netscape (Composer, Navigator), Interactive Whiteboards (Intelliboard, Polyvision, and SmartBoard), Multi-media Presentations with LCD Projector, Use of Student-Response Systems (Turning Point, CPS), Digital Presenters (Elmo), GradeQuick, Acuity, TechSteps/activeBook, Writing Roadmap 2, TI 73 Calculators, TI-Nspire CAS Calculators, Movie Making Programs (Windows Movie Maker, Pinnacle), Mobile Presenters (SMART Airliner Slates, Intelliboard Mobile Presenters), Making Podcasts, EasiTeach, Camtasia, BlackBoard Learning System

**Volunteer
Activities:****Advisor, Alpha Phi Omega, National Co-Ed Service Fraternity**Fall 2004 to
present

Alpha Zeta Mu Chapter, Shepherd University

Sunday School Teacher and Technology CoordinatorFall 2003 to
present

The Salvation Army, Martinsburg, WV

Relay For Life Team CaptainSpring 2003 to
present

Berkeley County, WV Relay For Life

**Additional
Information:**

References and additional information available by request.