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**Middle School Principals' Perception
of the Effect of Technology on Job Effectiveness**

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Graduate School of Education
and Professional Development**

**Dissertation submitted to the faculty of the
Marshall University Graduate College
in partial fulfillment of the
requirements for the degree of**

**Doctor of Education
in
Educational Leadership**

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Thomas Williams, Ed.D.**

Huntington, West Virginia, 2009

**Keywords: technology, job effectiveness, administrators, middle school,
computers**

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ABSTRACT

Middle School Principals' Perception of the Effect of Technology on Job Effectiveness

The use of computers and computer-based applications is prevalent in schools, from the classroom to the principal's office. This study of middle school principals in Virginia and West Virginia addressed the following eight questions: (a) What computer technology applications are available to middle school principals? (b) What are the perceived levels of abilities of the middle school principal in regard to computer and keyboarding skills? (c) To what extent do differences exist in the skill levels of principals in demographic groupings? (d) To what extent are applications and programs used by middle school principals? (e) Is there a difference in usage among principals of different demographic groups? (f) Which administrative tasks are the most likely to be related to computer technology? (g) How do principals perceive computer technology affects their ability to perform specific job responsibilities? and (h) To what extent do differences in perception of how job effectiveness is affected by technology exist among middle school principals of different demographic variables?

The study determined that principals overwhelmingly found the use of computer technology made them more effective administrators and the perceptions are consistent through a variety of demographic areas including age, gender, education, and years of experience. This study found Internet usage, e-mail communications and word processing applications to be computer applications most used by administrators. The study found that principals most often used the computer for writing, gathering data, and planning work schedules; the administrative responsibilities most related to technology were discipline, staff communications, and attendance.

The study also found that principals have access to computer technology at school and at home, but only 46% of the principals could access the school/district network away from the school setting. Principals stated that they had been using the computer at work throughout their careers, and the highest rates of weekly usage were 6-10 hours a week and 16-20 hours per week.

DEDICATION

To my mother and father, who always believed anything was possible and every day would be better than the last; to the people, flora, and fauna of Blue Creek, West Virginia, and the water of the Elk River, from which all of my inspirations, reflections, and actions originate.

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CHAPTER ONE: INTRODUCTION

Introduction

The position of the school administrator is complicated and multifaceted. An effective administrator faces a variety of tasks to successfully manage both the short- and long-term responsibilities of school management. Principals are expected to be leaders of a number of school responsibilities, including facility operation, staff management, accounting and finances, community relations, and most importantly, student achievement. These responsibilities have increased with the greater import of regulations, policies, and responsibilities from both state and federal sources.

National and state scores on standardized tests, in addition to the maintenance and development of school staffing, are now considered effective measures of the job effectiveness of the building-level administrator (Sager, 1999). The measures are highly focused due to the immediate and increased communications provided by technology systems and applications.

One of the most important facets of effective use of technology is the educational leader's competence in using the available programs and applications (Bozeman & Spuck, 1991). Sawtelle (2008) proposed nine essential concepts for successful computer software implementation: (a) objectives in place before obtaining software, (b) proper planning before implementation, (c) positive stakeholder involvement, (d) evaluation criteria, (e) effective leadership, (f) adequate technology in the facility, (g) user knowledge, (h) usage monitoring, and (i) evaluation of usage from each of the previous stages. In terms of school-based

curricula, Brockmeier (2005) noted that administrators who are technologically adept are more likely to assist teachers in the educational process. Prensky (2006, p. 20) stated that “educators have slid into the 21st Century —and into the digital age . . . still doing a great many things the old way.” Prensky also coined the phrases “digital natives” and “digital immigrants” to describe individuals who have cognitively developed through a time of technological use as opposed to those who have had to learn technological techniques for the purpose of work or recreation.

Statement of the Problem

School administration is a complicated position with a variety of responsibilities. Tasks are numerous and often require the recording and reportage of information and data to a number of resources, including the school communities, district and state level organizations, and outside groups such as local media, businesses, and community organizations.

This immediacy of information has changed what is required of the school administrator. The ability to locate, gather, synthesize, and distribute a variety of information is now a standard procedure for the school principal. This “immediacy of informational exchange” has become an additional task for a school administrator; computer technology and applications of this technology have become central skills for principals. This usage of computers to by administrators is a relatively new phenomenon to be more thoroughly explored, far beyond the current research.

There is a dichotomy of thought about the extent to which computer technology has affected the task responsibilities of the school administrator. It has not been clearly demonstrated whether administrators perceive computer technologies to be an asset or hindrance to job effectiveness. Although there are a number of studies relating to the defined technological tasks of the administrator, there is a paucity of research that identifies specific perceptions of school administrators in respect to how their abilities to effectively perform administrative tasks have been affected by computer programs and applications. This lack of research leaves an important consideration unaddressed: whether or not middle school administrators' perceived abilities to effectively complete assigned tasks have been positively or negatively affected by computer technology.

Purpose of the Study

The aim of the research is to define and describe the perceptions of middle school principals in Virginia and West Virginia related to computer technology, applications, programs and job effectiveness. The use of computer applications has transformed the principal's job requirements and tasks. In order to understand how principals effectively complete workday tasks, this research defines how principals perceive the technology and its effect on a school administrator's ability to perform required job responsibilities.

Review of the Literature

Middle Schools

Adolescence and education meet in a confluence of celebration and consternation known as middle school education. Traditionally consisting of students ages 11-14, and some configuration of grades 5, 6, 7, 8, and 9, the middle school is a place and time where students begin the transition from childhood to adulthood and face challenges that accompany physical, social, emotional, and cognitive growth. It is a time when “every day brings the chance to embrace absurdity while achieving substance” (Wormeli, 2001, p. xvi).

While all schools are unique, the middle school configuration is often noted as particularly challenging due to the stress and struggle inherent with the levels of emotional and physical maturities of the students. In order to identify the most effective methods of helping students at this level achieve success, many studies have offered suggestions to what types of programs and strategies the “typical” middle school should offer.

The first report was the Carnegie Commission’s (1989) *Turning Points: Preparing America’s Youth for the Twenty-First Century*. This report gave eight components of an effective middle school: (a) teams of student and teachers working together, (b) a common core of knowledge, (c) organization centered around the needs of the students, (d) teachers and administrators empowered to make decisions about the student learning, (e) staff who are experts in the field of the middle-level child, (f) a promotion of healthy lifestyles and choices, (g) families and schools linked together, and (h) a partnership of schools and

community resources. Since its inception, the components of a middle school have evolved, and the commission, in its work, *Turning Points 2000*, has enlarged the number of precepts to a total of ten, the concepts including details about democratic governance and curriculum design (Jackson & Davis, 2000). In 2006, the National Association of Secondary School Principals (NASSP) formed a policy paper that defined eleven needs for reform, including “improving literacy skills at all levels,” and noted “less than one-third of U.S. eighth grade students can read and write with proficiency” (NASSP, 2006, p. 2).

The Role of the Principal

To be an effective school administrator, the principal must successfully manage or complete a wide range of responsibilities. Job effectiveness, or the ability to complete designated job-related tasks in a successful, efficient manner, is a key component of any position. DiPaola and Tschannen-Moran (2003) reported the top five significant changes for school administrators since 1998 were increased accountability, a greater focus on student test scores, more paperwork, less support from parents and the expanded use of technology for managerial responsibilities. In addition, more than 54% of respondents listed e-mail use as the primary task that had the greatest increase of time usage during the same period.

It is clear that the accessibility of technology and the accompanying responsibilities have transformed the way administrators work. The use of informational databases, student-based learning programs, e-mails, and calendar tools can affect job effectiveness (Hopkins, 2006). One recent study of business

managers reported that more than 65% of respondents spent one to three hours per day responding to electronic communications or directives (AST, 2006), and Buck (2007) listed school finances, data collection, data storage, and student recognition as daily administrative responsibilities the principal now simplifies and facilitates with computer applications.

This transformation of the workplace technology is compounded by the changing responsibilities of the principal. With the advent of technologies that require/enable the administrator to respond electronically to a variety of constituents, the effective administrator must possess a variety of technological skills. Bober (2001, p. 2) stated the successful administrator must respond to greater accountability with “school information systems” that include addressing improved staff communications, community relations, and informed data-based decision making about the school curriculum and basic operational functions.

The Collaborative for Technology Standards for School Administrators (2001) created administrative standards for effective principals. The standards include six main headings: (a) Leadership and Vision, (b) Learning and Teaching, (c) Productivity and Professional Practice, (d) Support, Management, and Operations, (e) Assessment and Evaluation, and (f) Social, Legal, and Ethical Issues. These standards include 31 subheadings that outline specific duties such as integrating strategic and technology plans, advancing organizational improvement, collecting and analyzing data, and assessing, managing, and evaluating operational and administrative systems.

In addition to the CTSSA recommendations, the Southern Regional Education Board proposed eight technology standards for administrators, and Flowers and Algozzine listed nine technology competencies for all educators (Whale, 2003). The broad variety of traditional and newer duties that are incorporated with technology illustrates the broad range of activities that contribute to the daily responsibilities of the school administrator. It is now important to identify how principals perceive the effect of technological programs on their ability to successfully complete their responsibilities.

Virginia and West Virginia

As the rigor and responsibilities for effective education increase in number, policymakers at the state and national levels have understood the need for administrators and teachers to employ a variety of supports to successfully implement and use technology in the schools (Petzko, 2002). In fact, certain structural components such as equipment, time, support from leadership, and technical assistance may serve to facilitate or impede effective technology implementation (National Center for Education Statistics, 2000). Both Virginia and West Virginia have implemented training and standards to address the technological and educational goals of teachers and administrators.

The Virginia Department of Education (VDOE) in its 2000 report, *Technology Enriched Administrators: Modules for Guiding the Integration of Educational Technology in Education*, noted that technology education and training “must include a comprehensive experience with practical applications as well as discussions of pertinent issues related to the implementation and support

of technology” (p. 7). The program included three main concepts: (a) understanding technology management issues, (b) impact of technology on educational change, and (c) administrative uses of technology. Within the three main concepts, the plan issued seventeen individual recommendations to enhance administrators’ computer knowledge and effectiveness, including managing software and hardware acquisition and upgrades, creating a change environment, organizing and analyzing data and using internet sources.

In addition, the VDOE created a web-based technology initiative in 2000 that provided for its technology learning standards to be available to students. This program mandated instruction, remediation, and achievement-testing capabilities be online. They created school-readiness programs to reflect implementation of the standards, and in the first year, the department recognized that 100% of high school and 59% of all middle school divisions had achieved School Readiness Certification (2005).

In 2006, the West Virginia Department of Education (WVDOE) published *The West Virginia Story: Putting the Pieces Together*. This work was a comprehensive examination of the state’s new involvement in *21st Century Learning*, a statewide initiative designed to improve student learning and address new concepts such as revising learning standards, incorporating technology into learning, and creating a broader worldview of learning. One section of the plan was titled *Technology for 21st Century Learners* and contained 17 recommendations for enhancing education, including providing all staff and students with equitable access to technology, design a technology skills

assessment for all educators, and provide software for realignment of learning standards and objectives.

In 2005, the WVDOE became the second state, after North Carolina, to join the Partnership for 21st Century Skills. This organization, which in 2009 included 13 states, is an advocacy group of educators and industries such as Apple, Dell, Adobe Systems, Inc., and the American Association of School Librarians, that seeks to develop new skills and technological tools and incorporate them into education policies and practices (Partnership for 21st Century Skills, 2009). The WVDOE also created a West Virginia Institute for 21st Century Leadership as training academies for administrators. Principals in attendance were given laptop computers and had daily technology meetings. The institutes were for one week in the summer with three-day follow-ups in the fall and spring (WVDOE, 2006). By 2009, 475 of the state's 700 administrators had received training, and an additional 1200 teachers have been through a similar program (Gerwitz, 2008). In 2009, the WVDOE changed the title of its program initiative from *21st Century Learning* to *Global 21* and restructured its online staff training and student testing programs to reflect more rigorous standards. This program was in line with the No Child Left Behind (NCLB) initiative, a national education policy that also included a mandate for all students to be technologically literate by the eighth grade.

In 2001, the *No Child Left Behind Act* was promoted by President George Bush and passed by the United States Congress. The act became law when signed by President Bush on January 8, 2002. In *No Child Left Behind: A*

Toolkit for Teachers (United States Department of Education, 2003) the law and its four components are described by the following:

With passage of No Child Left Behind, Congress reauthorized the *Elementary and Secondary Education Act of 1965* (ESEA)—the principal federal law affecting education from kindergarten through high school. In amending ESEA, the new law represents a sweeping overhaul of federal efforts to support elementary and secondary education in the United States. It is built on four common-sense pillars: accountability for results, an emphasis on doing what works based on scientific research, expanded parental options, and expanded local control and flexibility.

As part of the accountability provision set forth in the law, No Child Left Behind has set the goal of having every child make the grade on state-defined education standards by the end of the 2013-14 school year. To reach that goal, every state has developed benchmarks to measure success and make sure every child is learning. States are required to separate (or disaggregate) student achievement data, holding schools accountable for subgroups of students, so that no child falls through the cracks. A school or school district that does not meet the state's definition of "adequate yearly progress" (AYP) for two straight years (school-wide or in

any subgroup) is considered to be in need of improvement. (p. 4).

For West Virginia schools, the measurement tool for student achievement is the West Virginia Educational Standards Test (WESTEST), a test that measures student knowledge of reading/language arts, mathematics, science, and social studies. Currently, only the categories of reading/language arts and mathematics are areas of accountability for No Child Left Behind in West Virginia and students in grades 3-8 and 10 are tested (West Virginia Department of Education, 2003). For schools to meet NCLB standards, average yearly progress measurements were held only for grades 3, 6, 7, 8, and 10, and only minority subsets of 50 or more were considered for measurement until 2009, when high school testing expanded to grades 9-11 and the testing schedule for state districts was set by the WVDOE. Under the former testing procedures, an elementary or high school with traditional grade configurations had to meet scores in one grade, while the typical middle school of grades 5-8 or 6-8 had to meet standards in all three grades.

In Virginia, No Child Left Behind standards are titled *Standards of Learning* (SOL), and assessments are scheduled by district. The Virginia Department of Education (2009) has stated five goals for student achievement:

- All children achieve high academic standards and are proficient in reading and mathematics.
- All children of limited English proficiency become proficient in English.

- All children are taught by highly qualified teachers.
- All students attend schools that are safe, drug free, and conducive to learning.
- All students graduate from high school (p. 1).

Perhaps the most far-reaching effect of the No Child Left Behind Act is the requirement that all students be technologically literate by the eighth grade. This has directly affected the technology plans of all states (Hightower, 2009), including Virginia and West Virginia. In a study of school principals, McPeake (2007) noted that 50% of school principals considered the NCLB mandates an increased focus requiring administrators to devote more time and energy to management.

Both states have received positive attention for their technological efforts. In 2007, West Virginia was one of two states to receive a grade of A in *Education Week's Technology Counts 2007* edition. In 2009, West Virginia received an A, and Virginia received an A- (Gerwitz, 2009). In a comparison overview of the two states, (Education Week, 2009), West Virginia received A grades for the categories of *Use of Technology*, *Capacity to Use Technology*, and *Access to Technology*. Virginia received an A- in the first and third categories and a B in the second. In the *Capacity to Use Technology* category, it was noted that West Virginia required technology training of both teachers and administrators in staff development while Virginia did not.

Research Questions

This study will answer the following questions regarding a school administrator's interaction with and perceptions about technology usage in relation to job effectiveness:

1. What computer technology applications are available to middle school principals?
2. What are the perceived levels of abilities of the middle school principal in regard to computer and keyboarding skills?
3. To what extent do differences exist in the skill level of principals by demographic groupings?
4. To what extent are applications and programs used by middle school principals?
5. Is there a difference in usage of technology among principals of different demographic groups?
6. Which administrative tasks are the most likely to be completed by computer management tools?
7. How do principals perceive computer technology affects their ability to perform specific job responsibilities?
8. To what extent do differences in perception of how job effectiveness is affected by technology exist among principals of different demographic variables?

Instrumentation

The study will use the *Perceptions of Technology on Job Effectiveness* (PTJE) survey developed by John Stephen May. May developed this survey instrument for a 2003 research project in partial fulfillment of degree requirements for Northern Illinois University. The survey defined four specific components as related to school administrators: (a) demographic information of the respondent, (b) respondent's level of access to technology (c) the amount of computer usage respondents had in their position on a daily and weekly basis, and (d) identification of computer and computerized programs that school administrators related to their job.

The demographic portion of the survey was modified from an instrument that measured responses of high school principals to one that measured the responses of middle school principals. To accommodate the electronic nature of this survey, the numbering format of the survey questions was reformatted, but no content-related changes were made to other sections of the survey.

Delimitations

The study was sent to school principals of middle schools in Virginia and West Virginia. Only those identified as principals were sent the survey, and the study did not include other school administrators such as assistant principals of curriculum, attendance or discipline. The study did not include administrators at the district level. Only principals at public schools were surveyed, and private school administrators were not included.

Limitations

Limitations of this study include the following:

1. The survey was limited to school administrators in Virginia and West Virginia.
2. The survey was limited only to those administrators who serve as principals in schools identified as middle schools.
3. The survey was sent during the spring, at time of testing, seasonal vacations and preparations for end of school activities, which may have affected the rate of response.
4. The survey was sent via electronic mail. Respondents may have disregarded the survey as a non-school-related activity and immediately removed it from their computer.

Operational Definitions

For the purpose of this study, the following terms were used:

1. Computer technology—An available computer used by the school administrator.
2. School administrator—A middle school principal.
3. School communities—Group populations within a school environment, such as students, teachers, and service personnel.
4. Computer applications—Software or programs specific to the operations of the school, which may include, but are not limited to, tasks such as attendance monitoring, communications, evaluations, data collection, and data disaggregation.

5. Software—Computerized programs that are designed for or used with the completion of administrative tasks and responsibilities.
6. Job effectiveness—The ability to complete designated, job related tasks successfully.

Summary

The introduction has described the role of the school administrator and the scope of the challenges presented by the position. This chapter outlined the problem and questions presented for the purpose of the study, as well as the method chosen to investigate and measure the data used to define the study. The introduction provided the design, instrumentation, limitations and delimitations of the study. A glossary of terms and a list of resource material are included.

CHAPTER TWO: REVIEW OF LITERATURE

Introduction

Since 1990, modern computer technology has changed many aspects of our life, including how we communicate, spend our leisure time, and especially, how we work (NCES, 2000). Computer technology in the workplace has become common and readily accepted. Seventeen years ago, the United States Census Bureau (1991) reported more than 37% of adults had used a computer or computer technology at the workplace, an increase a 12% increase since 1984. By 2000, 90% of all schools had Internet access and offered Internet accounts to the staff (Slowinski, 2000). Research conducted by the North Central Regional Education Laboratory found that in 2001, there were 143 million Americans using the Internet, a growth of 26 million users in one year (2003).

The United States Census Bureau (2005) found that households with computers had grown from 8.2% in 1984 to over 61% in 2003. In 1984, no households reported having Internet access, while less than ten years later, 54.7% of households accessed and used the Internet. At this time, more than half of all adults reported using e-mail or instant messaging for communication purposes.

In the last five years, computer usage has become omnipresent, with 75% of all women and 73% of all U.S. adults reporting daily computer usage. In terms of computer usage by age, it was reported highest by groups in the 18-29 (87% of all respondents) and 30-49 (82%) age ranges, with fewer respondents (72%) in the 50-64 age group, and less than 41% in the 64 years and older range. College graduates showed a 95% usage rate, while those without a high school degree

were the lowest score of any group measured (35%). Respondents who identified themselves as Suburban in their type of community had a 74% usage rate, followed by Urban (71%) and Rural at 63% (Infoplease, 2008).

Computer technology is so present in the workplace that a simple newspaper cartoon revealed the depth of a worker's technological savvy. In four cartoon panels, the following scenario develops: The boss walks into the office, berating the employee: "Bumstead!" he cries. "I've been timing you! You've wasted 25 minutes writing personal e-mails and 23 minutes yakking it up in the break room! Add to that the 30 minutes of cyber-poker, phone calls and you've done virtually no work this morning." As the boss storms from the office, the employee states, "Well at least some good came of it." (Young & Marshall, 2008. p. 1).

With the greater availability and access to computer technology, it is important to examine the role of computer technology in the daily administrative tasks of middle school principals. This chapter will provide a review of the literature that pertains to the growth and development of the concept of middle school education, the role of the middle school principal, administrative job effectiveness, and the usage of computer technology by middle school principals.

History of Middle Schools

The advent of the middle school concept in the 1950s and 1960s has been hailed by some supporters as the last major renovation of the stratification of the public education system in the United States. Taken from the junior high format, which replicated the high school patterns of scheduling and curriculum, the

middle school concept has evolved into a series of educational concepts that focus on the developmental needs of the students. Ricken and Terc (2004) stated, “We sincerely believe that the only positive example of restructuring American education in the past half-century was the movement that developed the middle school to replace the traditional junior high school” (p. xv).

George and Alexander (1993) reported the junior high concept began in the early part of the 1890s as an outgrowth of the two-level 8-4 grade configuration consisting of an elementary school of grades 1-8 followed by a 9-12 four-year high school. This educational format was changed due to the needs of colleges to have more educationally astute students, particularly those with greater backgrounds in foreign languages and mathematics, as well as public concerns over school dropouts and the need to extend secondary schooling (Van Til, Vars & Lounsbury, 1961). Briggs (1920) described a survey of college professors, state and city school superintendents, and school principals that listed three essential components of the junior high structure: (a) separate from the high school, (b) separate from the elementary school, and (c) a distinct unit of education. Yet by the middle of the century, Koos (1953) was reporting criticism of the structure in magazine articles with titles such as “Has the Junior High Kept Its Promise?” and “Has the Junior High School Made Good?” George and Alexander (1993) provide a succinct history of the junior high model during this period:

The junior high school movement really spread after 1920. The increased birth rate after World War I, and other factors increasing

our population, meant mounting school enrollments and overcrowded schools. One answer to crowded elementary and high schools was to move grades 7-9 into a new building (or the old high school) and just build one new building. Also, genuine improvements in education were made in many junior high schools that could be secured by organization elsewhere, too. Whatever the reason, instead of the situation in 1920, when four of every five high school graduates had attended an 8-4 organization, forty years later, in 1960, four of every five high school graduates had attended a 6-3-3 system. The junior high school had become common, but it was already under criticism and another school in the middle was in the offing. (p. 25).

Beginning in the 1960s, the middle school concept was the key focus of junior high reform (Lounsbury, 1996) and was being debated for its proposed structure and applicability to student academic success. The growth in middle schools rose to more than 11,000 by 1993-94 with more than 4.4 million students enrolled. The change was prominent in grade configuration as well, as the prime 6-7-8 grade levels for the middle school rose from five percent in 1965 to almost 60% in 2002 (Clark & Clark, 2003).

The components of the middle school were established more than 10 years later by the Carnegie Corporation of New York, which formed the Carnegie Council on Adolescent Development in 1986 and a Task Force on the Education of Young Adolescents in 1987 (Jackson & Davis, 2000). Their report, *Turning*

Points: Preparing American Youth for the 21st Century (1989), listed principles deemed essential for any effective middle school: (a) teams of students and teachers working together, (b) a common core of knowledge, (c) organization centered around the needs of the students, (d) teachers and administrators empowered to make decisions about student learning, (e) staff who are experts in the field of the middle-level child, (f) a promotion of healthy lifestyles and choices, (g) families and schools linked together, and (h) a partnership of schools and community resources.

Ten years later, the commission published an updated list of components of a middle school. The recommendations have evolved and the commission in its work, *Turning Points 2000*, has enlarged its eight precepts to a total of ten including new concepts of democratic governance and curriculum design in greater detail (Jackson & Davis, 2000). In 2006, the National Association of Secondary School Principals (NASSP) formed a policy paper that defined eleven needs for reform, including “improving literacy skills at all levels” and “less than one-third of U.S. eighth grade students can read and write with proficiency” (NASSP, 2006, p. 11).

As the middle school educators faced the challenges of implementing developmental education responsive to a shifting and growing list of responsibilities, they found the concept of middle schools under scrutiny. In 2005, *Time* magazine featured a cover story titled *Is Middle School Bad for Kids?* in which Wallis (2005) wrote,

How did middle schools, which were ushered in with such fanfare 25 years ago, fall into such disrepute? The answer, many educators say, had less to do with the philosophy of the middle school movement and more to do with how it was executed. Coming after a period of juvenile unrest, when juvenile crime and drug use were rising, middle school proponents argued that old-fashioned junior highs, which usually served Grades 7 and 8, and sometimes 9, were not meeting kids' social and developmental needs (p. 3).

The same year, the Thomas B. Fordham Institute published *Mayhem in the Middle: How Middle Schools Have Failed America and How to Make Them Work* (Yecke, 2005), and the author listed a number of middle school academic failings and defined *middle schoolism* as “an approach to educating children in the middle grades . . . that contributed to a precipitous decline in academic achievement among American early adolescents” (p. 1). In a series of articles on middle schools, the *New York Times* printed stories that focused on the travails of middle school education with headlines such as, “For Teachers, Middle School Is a Test of Wills” (Gootman 2007), “Middle School Manages Distractions of Adolescence” (Hu, 2007), and “Trying to Find Solutions in Chaotic Middle Schools” (Gootman, 2007), in which the author stated,

Driven by newly documented slumps in learning . . . educators across New York and the nation are struggling to rethink middle school and how best to teach adolescents at a transitional juncture of self-discovery and hormonal change” (p. 1).

The Effective Middle School Principal

It is in the shifting tides of middle school structures and concepts, adolescent behavior and expectations that the middle school principal finds the greatest challenges. Tirozzi (2001) described the role of the school principal as “the instructional artist in residence” (p. 435), responsible for creating positive school climate, visions for academic and staff excellence, and overseeing strategies in curriculum, instruction, and assessment. As all principals face greater responsibilities, how is the middle level administrator different? Ricken and Terc (2004) provided a report from a New York education panel that listed nine Essential Knowledge and Skills for Effective School Leadership:

1. Leaders know and understand what it takes to be a leader.
2. Leaders have a vision for schools that they constantly share and promote.
3. Leaders communicate clearly and effectively.
4. Leaders collaborate and cooperate with others.
5. Leaders persevere and take the long view.
6. Leaders support, develop and nurture staff.
7. Leaders hold themselves and others responsible and accountable.
8. Leaders never stop learning and honing their skills.
9. Leaders have the courage to take informed risks (pp. xvii-xix).

This list of effective traits and actions is one of several found in the research. McEwan (2003) listed ten traits, including communicating, creating vision, building change, and building character, while Marzano, Waters, and

McNulty (2005) listed 21 notable principal traits that affected student achievement, with situational awareness, personal flexibility, protecting teachers from interfering influences, advocating for the school, and monitoring/evaluating the workstaff as the five most important.

The Council of Chief State School Officers (2008) added to the lists and descriptions of effective principals with the publication of *Educational Leadership Policy Standards: ISLLC 2008*. The list of expectations included six main standards:

1. An education leader promotes the success of every student by facilitating the development, articulation, implementation and stewardship of a vision of learning that is shared by all stakeholders.
2. An educational leader promotes the success of every student by advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth.
3. An education leader promotes the success of every student by ensuring management of the organization and resources for a safe, efficient, and effective learning environment.
4. An education leader promotes the success of every student by collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources.

5. An education leader promotes the success of every student by acting with integrity, fairness, and ethics.
6. An education leader promotes the success of every student by understanding, responding to, and influencing the political, social, economic, legal and cultural context. (pp. 3-4).

Bauck (1987) reviewed two studies by the National Association for Secondary School Principals, which researched middle school principals and noted eight practices that led to a greater level of effectiveness; middle school principals needed to work well with others, have greater orientation towards teachers, have more experience or a longer tenure, have a more positive outlook towards their job and its responsibilities, use time efficiently, have a high level of community involvement, and tended to come from larger communities, with schools of higher enrollment, more counselors, and greater amounts of financial resources per student. He also noted that two factors—formal education and membership in professional associations—had little bearing on job effectiveness. This finding echoed that of Anfara, Brown, Mills, Hartman and Mahar (2000) who noted that effective middle school principals had five common traits: (a) a highly positive expectation about the level of their work, (b) an increased level of orientation towards their teaching staff, (c) community and parent involvement at the school, (d) tolerance for uncertainty and ambiguity, (e) and an internal directive to hire, train, and keep a dedicated staff of teachers who have intentionally chosen to be in a middle school setting. Again, the two factors not

related to job effectiveness were levels of education or training at the middle level and membership in professional organizations.

Valentine, Goodman, Matthews, Klingsmith and Mees (2008) found that the actions of the middle school principal relate directly to student achievement and found those principals who had the most interactive leadership processes, who best articulated and identified vision, provided intellectual stimulation, and focused on instructional improvement were the most likely to be effective school leaders. They also found that principals influenced student achievement through engaging in instructional issues at the school, developing effective organizational practices, facilitating a vision of learning with the faculty, and maintaining up-to-date knowledge of best practices while supporting the faculty to do the same.

While the various descriptions of the position are daunting, researchers often note that not all descriptors are equally managed. In a study of secondary principals in Iowa, Gilson (2008) noted that more than 83% of the principals' time was spent in tasks identified as instructional and organizational leadership.

Given these findings, the principal with greater personal and professional support, task efficiency training, and positive intrinsic attitudes would usually be a more effective middle school administrator.

Barriers to Job Effectiveness

The middle level principal's professional responsibilities range widely and require many personal skills to be effective. According to Seyfarth (1999), daily tasks involve a number of individual issues of teachers, students, parents, and

other administrators, and according to McKinney and Garrison (1994) the principalship is characterized by “brevity, fragmentation and variety” (p. 5).

Although many studies exist on common traits of successful principals, there are also a number of studies that list impediments to job effectiveness. With a high number of administrative turnovers and fewer professional trainings for principals at the middle level, the job of middle school principal can be described as having less job security and more rigor than in the past (Petzko, 2002). This increase of administrative responsibilities was cited by Norton (2002) as having five components identified in the 2005 work of Kennedy: (a) the ever-changing demands of the job; (b) lack of financial /salary support; (c) insufficient time for task accomplishment; (d) negative attitudes of students, parents, community members, and media; (e) and general lack of personal and professional respect. Clark and Clark (2003) reported, “The job of the middle level principal has become increasingly demanding over the years” (p. 51), and noted that the three studies completed by the National Association of Secondary School Principals about middle level principals, the most recent findings found the principals were less prepared, older, and less experienced than in previous studies. Fifty-six percent of the administrators believed they would no longer hold an administrative position at the middle level in the ensuing three to five years.

Barriers to job effectiveness may be seen as both internal and external. The intrinsic expectations of the individual may create as much dissatisfaction with the position as outside influences. Expectations of performance by the principal, along with external issues such as educational accountability, put

principals into public and political scrutiny they may not expect. Governance issues, the characteristics of the position, and general regulatory activities, such as dealing with staff, completing evaluations and other paperwork issues, and conflicts with parents or community can be seen as contributors to dissatisfaction and barriers to job effectiveness (Daresh, 2000). Petzko reported that the items most identified by principals as barriers to job effectiveness were the time required for administrative tasks and mandates and regulations from local and state boards. The principals felt the most time should be given to program development and personnel, yet devoted the most of their time to school management issues (2002). Petzko, Clark, Valentine, Hackmann, Nori, and Lewis (2002) described the middle school principalship as “unequivocally demanding” within the position (p. 8). The authors noted that in the study of more than 1400 middle school principals, there were 11 consistent barriers to job effectiveness: (a) time spent on administrative details, (b) regulations, and policy demands; (c) time spent on personal activities and interests; (d) problems with parents; (e) inadequate funding; (f) unwillingness to change; (g) problematic students; (h) poor physical facilities; (i) lack of planning time with teachers; (j) lack of dedication on the part of teachers; (k) and time spent supervising school activities . They proposed six changes to enhance the job effectiveness of current and new middle school administrators: actively recruiting new administrators, creating staff development opportunities that address the needs of adolescents, using the assistant principal position as a training for new administrators, creating relevant

learning experiences at the university level, providing trained mentors, and creating opportunities to sustain current middle school administrators.

The use of technology by the middle school principal must be viewed as both a tool for improved job effectiveness and a barrier to the same. McPeake (2007) noted “increased technology has added to the responsibility of maintenance and upgrading the principals’ never ending list of to-do’s” (p. 6). Some aspects of technology have proven to be a burden for educators. A research report of the American Society for Training and Development described e-mail usage as a “good/evil notion.” Although 95% of respondents claimed e-mail use was *important, very important, or extremely important*, more than two-thirds listed timely e-mail responses as a source of professional frustration (2006, p. 22).

This frustration can create barriers to effective technology usage. Sherman (2009) reported the four technological impediments to technology described by Ian Jukes as *The Four Global Exponential Trends*: (a) the concept known as Moore’s Law, which predicts all technology is outdated within 18-24 months of creation; (b) the need for the tripling of bandwidth every six months; (c) Internet uses that cannot be predictably integrated, such as online voice recognition programs or 3-D holograms; and (d) a flood of information that the brain cannot absorb, in which the user is “infowhelmed” (p. 3).

For principals without proper training and exposure to new technologies, Brockmeir, Sermon and Hope (2005) found that principals must be able to use an array of technologies while becoming familiar with their uses, be able to apply these uses to learning and teaching, and promote the use of technology. This

confrontation of personal abilities to technological advancements can contribute to a feeling of being technologically inept. In addressing the impact that new technology usage creates, Moulton (2008) stated,

It occurred to me that the challenge of using technology effectively in education is actually because of its assets—current assets and resources are so abundant and allows us to do so many thing it can be overwhelming. . . . [T]he very richness of technological possibilities cause you or others you know to feel overwhelmed and remain stagnated rather than advance in any direction (p. 1).

Principals and Technology

Technology in education is filled with a variety of diverse tools and functions. It can include laptop and desktop computers; audiovisual technology, such as projectors, DVD and enhanced-CD players, and Smartboards; as well as calculators, cell-phones, and other handheld devices. The use of computers in the school setting can be manifested in a number of ways, including the using the computer as an administrative tool, a teacher tool, or a student tool as well as focusing on the computer as an area of student study (NMSA, 2007).

The use of the computer and computer technology has increased tremendously in the last ten years. A report by the United States Census Bureau (2005) showed that in 1982, less than 10% of households in America had a computer in the home, but by 2003 the percentage had risen to more than 60%. According to information of the Census Bureau's *Statistical Abstract* (2008), the percentage of adults using the internet at home was at 73%, an increase of nearly

25% from 1995. More importantly, the report listed 92% of individuals responding who had at least a college education, which would include all middle level principals, used a computer on a regular basis. Most respondents used the Internet for three tasks: (a) sending or reading e-mail, (b) searching for information, or (c) getting news. Professionally, the number of Americans who claim the Internet has positively affected their ability to perform job-related tasks increased from 24% in March, 2001, to 35% in April, 2006 (Madden, 2006). With technology-based activities becoming a constant in the workplace, the usage of computer-based technologies, such as communications, word-processing and data-related spreadsheets has become a worker requirement. Hipple and Kosanovich (2003) described the computer as “a hallmark of the work place in postindustrial America,” and “an indispensable tool on the job.”

For principals, many of the daily administrative tasks are affected by computer technology. Ringstaff and Kelley (2002) stated, “In today’s world, computer-based technology is not a frill but an important part of any curriculum” (p. 1), and reported that expenditures for technology had tripled in the last decade. The National Center for Education Statistics (2000) noted the following:

Over the past 20 years, educational technology has been a major focus of reform and policy at the federal level, as well as the state and local levels. Such initiatives have been guided by the goals of increasing the availability of computers in the classroom and school, assisting with internet access, and providing resources and guidance for training and the integration of technology in the curriculum. . . .

[I]n recent years, policymakers have recognized that teachers and administrators need resources and organizational capacity to implement instructional reforms (p. 3).

May (2003) reported that principals viewed technology as having positive impact on job effectiveness and that word processing, Internet access, and e-mail communications were the items most consistently identified as having positive impact. Gurr (2001) noted that in study of school administrators, most principals felt they could not fulfill duties without knowledge of tasks related to computer technology. In relation to task accomplishment and job effectiveness, Gurr (2001) reported,

ICT (information/communication technology) has fundamentally changed the work principals do by facilitating new types of work and improving older work patterns. Some of the changes are merely improvements in traditional practices, such as using spreadsheets to create budgets and accounts, e-mail for communication, and word processing software for writing. Others represent transformative change and the advent of new practices such as using sophisticated management information as core tools for school planning (p. 3).

As technology evolves and the number of administrative tasks reflects those changes, the middle school principal clearly needs strongly delineated tasks and skills to become technologically proficient and effective. The United States Department of Education (2005) stated “American education is being bolstered by the increasing use of educational technology” and noted the changes in

educational use of computers was “driven by an increasingly global economy and students themselves who are born and comfortable in the age of the Internet”

(p. 2).

In the United States Department of Education’s *National Education Technology Plan*, the first Action Step is “Strengthen Leadership.” The action step has five sub-recommendations for administrative leadership in technology: invest in leadership development to create principals who are tech-savvy, change leadership education programs to provide current training in a variety of administrative actions such as decision-making and organizational change, create partnerships between schools, communities and higher education programs, encourage business communities to partner with schools and increase/allow students to have input on technology programs. The plan provided six steps that must be considered by any school principal: budgeting for technology, training of staff, supporting virtual school programs, moving to digital content, planning for data systems, and enhancing broadband access.

To address the need for understanding the role technology plays in the tasks of the school principal, The Collaborative for Technology Standards for School Administrators (TSSA) created administrative standards for technology use by effective principals. Yu and Durrington (2006) described the main points of the TSSA and how the principals related to each standard. The standards include six main headings and corresponding actions:

1. Leadership and Vision: The principal develops a vision for technology within a positive school culture.

2. Learning and Teaching: The principal develops and assists others with the development of technology to follow curricula and the use of proper tools and strategies to ensure learning.
3. Productivity and Professional Practice: Principals apply their own knowledge of technology to improve the professional performance of others as well as enhance their own job effectiveness.
4. Support, Management and Operations: The principal works to integrate the use of technology throughout the school and provide appropriate hardware and software.
5. Assessment and Evaluation: The school principal should be able to implement and instruct others to use the technology for a variety of meaning formative and summative assessments.
6. Social, Legal and Ethical Issues: The principal should be knowledgeable of legal and moral issues related to the use of technology. (p. 303).

It is also important to note that the standards include 31 subheadings that outline other specific duties and include integrating strategic and technology plans; advancing organizational improvement; collecting and analyzing data; and assessing, managing, and evaluating operational and administrative systems (TSSA, 2001).

In 2009, the International Society for Technology in Education (ISTE) updated their *National Education Technology Standards* (NETS-A) with

standards and performance indicators for school principals to use to promote technology in the educational setting. The new standards were visionary leadership, digital-age learning culture, excellence in professional practice, systematic improvement, and digital citizenship. The standards were supported by twenty-one performance indicators that included goals for personal/professional use, serving as a model for others and ensuring the implementation of technology throughout the curriculum. In a study of West Virginia principals, Billheimer (2007) found that principals in West Virginia highly rated technology standards as a means to increase learning capacity to give them the ability to lead a transformative change in the ways schools implemented technology.

Researchers are discovering that data management systems and school information systems improve communications with staff and community, decision-making responsiveness, and empowerment of the school-based teaching staff (Bober, 2001), activities that are reflected in descriptions of traits of effective middle school principals. Other areas of the middle level principals' responsibilities that technology may be applied to include strategic planning and daily management activities. Accessing data and the management of information are two principal responsibilities that can be effectively enhanced by the middle level principal (Bozeman & Spuck, 2003). But, the acceptance of new technology application and usage may seem daunting to administrators who feel they are at task capacity. Over the past 20 years, the role of the principal has transitioned from school manager to educational change facilitator, whose responsibilities

include curriculum developer, staff mentor, and the personal representative for academic progress (Lecklider, Britten & Clausen, 2009), and Sawtelle (2008) noted that a variety of factors including planning, training, support of leaders, teaching practices and proper product use must be in place for the technology to be effectively implemented.

However, as commonplace as computer technology may be, the educational setting has been noted as an arena slow to accept its use. Benson, Peltier and Matraga (2000) noted that even as computers are more commonplace in the educational setting, “schools have usually been slower than businesses in adopting computer use” (p. 1). In 2005, United States Secretary of Education Rod Paige stated, “Indeed, education is the only business still debating the usefulness of technology. . . [W]e still educate our students based on an agricultural timetable, in an industrial setting, but tell our students they live in a digital age.” (United States Department of Education, 2005, p. 1). The Council of Chief State School Officers (2008) echoed this statement with “K-12 education is one of the last sectors in the United States that has not been transformed at scale in very fundamental ways by the onset of information and communication technologies” (p. 4). The National Center for Education Statistics (2000) reported outdated equipment; lack of training time; a paucity of immediate, qualified technical assistance; and negative leadership attitudes as the greatest hindrances to effective technology implementation, while Pelgrum (1993) found computer usage in schools largely depended on the attitudes of principals and teachers.

Principals' Usage of Technology

The use of computers by school administrators has become a reality and responsibility. Principals are now expected to act as both leaders and operators of a variety of technological tools, including computers, handhelds devices and cell-phones. Administrators must be able to use the technology as well as lead the teachers and students (Muir, 2007).

The growth of computers in schools has been explosive. In 1995 only 50% of schools had Internet access and by 2004, all schools in the country reported some form of access. During the same time, the number of computers per school increased from 72 to 154 (NCES, 2007). This growth was mirrored outside of the school environment as the percentage of adults using computers grew from 54% in 1995 to 73% in 2006, and adult Internet use was at 14% in 1995 and grew to 70% in 2006, and daily Internet users were more than twice as likely to report that using the Internet improved work related effectiveness (Madden, 2006).

School administrators are expected to use computers to improve the effectiveness of monitoring records, payroll information, and communications. They are expected to improve productivity through software for accounting, publishing, and online communications (Johnson, 1998), and “a long-term goal for any school district should be to use technology to improve administrative effectiveness through efficient communication, planning and record-keeping” (Johnson & Bartleson, 1999, p. 1).

Maddux, Johnson, and Willis (2001) described technology usage as belonging to one of two categories: Type I and Type II. A Type I usage is one that

educators use to imitate procedures that could be done without technology, such as record-keeping, posting communication content, and obtaining information. The authors note these are activities educators have done for many years; however, with technology, the procedures and product output is different, although content is similar. A Type II usage focuses on the innovation of the learning process and involves the empowering of the user to go beyond presented learning material and to use the technology to develop personalized goals and create new thinking via personal information investigations. The authors described the Type I usage as an automation of current practices and Type II is an innovation of learning information (Muir, 2007).

But the challenges of technology implementation can be daunting. Benson, et al. (2000) found that “computer anxiety” was seen as problem by more than 70% of principals, and this anxiety can be created with a few initial negative experiences (University of Florida, 1998). The initial resistance of using computers as effective tools for educators was described by Johnson (1998):

Big challenges present themselves when technology is used on a large scale as an information processing tool. First it requires a good deal more investment in time and effort . . . in learning how to use it. Anybody can learn to operate drill-and-practice software in a few minutes, but learning to use a database to store, categorize and sort information literally can take hours of instruction, weeks of practices, genuine effort and guaranteed episodes of pure frustration (p. 4).

However, the proliferation of computers and computer-based activity has shown an increase that mirrors the increase in computers for daily use. In 1997, Carter found that only 59.7% of principals were using e-mail communications, and that the biggest factors for usage were training, access to a computer, and previous computer use. The biggest barrier was a lack of familiarity with the technology. Celata (1998) studied high school principals in Virginia and found eight work-based activities the administrators listed as important technological strengths: printing information, using the student database for information, creating materials using word processing, using a modem, accessing e-mail, getting information from CD-ROMs, conducting internet searches for information, and using scheduling programs to create student and teacher schedules. Identified areas of weakness included using a digital camera, projecting budgetary issues and financial projections, using a spreadsheet, creating databases, and creating presentations with slideshow applications.

In a study of principals in Nevada, Benson, et al. (2000) reported that of all computer-based activities, word processing (80.6%) was used most frequently. Student/family database software was used on a weekly basis (79.8%), and student attendance and discipline materials were also frequently used (66.9% and 67.6 %) by principals. In demographic terms, the principals most likely to use computer-based applications were female, younger, had fewer years experience as a principal, and had a computer at home. Both middle and high school principals showed a greater inclination towards local district-based software than did elementary principals. In a study of North Carolina middle school principals,

Brown (2001) found the most identified use of computer technology was for e-mail and other electronic information for communication purposes. Instructional leadership tasks, such as locating curricular information or the creation of staff development information, had lower degrees of implementation.

In a study of Illinois principals, May (2003) found that principals viewed computer technology positively and believed it affected their effectiveness. In a ranking of administrative roles, the principals cited communication tasks as those having the greatest impact and usage, followed by management, teacher evaluation, leadership, curriculum issues and decision-making, and rated both their computer skills and keyboarding skills as above average. In addition, nearly all principals had a computer at home, although only half could access information from the school or district.

In 2005, Brockmeir, et al. found that principals felt they needed more professional development and training to be effective. The administrators listed assessing the role of technology on student achievement (85%), collecting and analyzing data (85%), integrating the computer into curricular activities (84%), using the computer in daily administrative tasks (80%), and facilitating change as the greatest areas of need for training to maximize effectiveness. The researchers noted that while there was a “considerable awareness” of the capabilities of technology, many principals still needed training and development in budgeting, database creation, presentation materials, and research.

In examining the role of the administrator and technology, Yu and Durrington (2006) used the International Society for Technology in Education’s

Technology Standards for School Administrators to measure principals'

perceptions of technological performance. The principals identified the standard of Social, Legal, and Ethical Issues as having the highest level interest, followed by Learning and Teaching, Leadership and Vision, Productivity and Professional Practice, Assessment and Evaluation, and Support, Management, and Operations. All responses were closely aligned, with a mean of less than 0.25 separating the six standards (p. 307).

Recent studies have found not all principals are adept with technology. Afshari, Bakar, Luan, Samah, and Fooi (2008) found that principals used the computer principally for internet access and software-based tasks such as word processing, and stated, "Principals are using computers for instructional and administrative purposes and administrative purposes, and they have moderate competency in modern computer applications" (p. 7). Lecklider et al. (2009) reported principals prioritized several areas of technology highly for school use: creating professional development (97%), instructional use by students (95%), improving access to technology (90%), improving the use of technology by teachers (89%), and planning the budget (74%). They also noted that in their observations, student use and knowledge greatly surpassed those of teacher or principal and stated, "Isn't it time our principals and teacher leaders find the skills and training to keep up with students in the 21st century?" (p. 32).

Summary

The wealth of information provided by computer technology can be daunting to any middle level principal. With the creation of more responsibilities and a higher level of accountability, the middle level principal may find it extremely difficult to effectively complete job responsibilities. With the numerous challenges presented by the changing responsibilities of the middle level education—a more politicized approach to education, the moral and legal issues of decision-making, and a lack of technological knowledge—it becomes imperative that the principal has a thorough understanding of computer technology for a variety of tasks including data management and presentation, communication, word processing, and location and integration of research. To be a highly effective administrator, the middle level principal must have a familiarity with the related skills this technology demands.

CHAPTER THREE: RESEARCH METHODS

As the role of the middle level principal becomes more diverse, with greater number of responsibilities, the effective administrator will seek new methods to maximize task accomplishment. The increase in available technological tools includes computers, software, and communication instruments such as e-mail, word-processing applications and database spreadsheets. These tools can create new avenues for the effective administrator to streamline responsibilities and complete daily administrative duties.

With the increased access to a number of technologies, it is imperative to examine the role of the school principal in using both the computer and software applications for managerial tasks. This study determined the access of middle school principals to the described technologies and their level of usage. The study also measured the principals' perceptions of their abilities to use such technologies to effectively complete administrative duties and the extent of usage in completing those duties. This chapter describes the methods implemented to measure the perceptions of middle school principals towards the effectiveness of technology in regards to task performance.

Research Questions

The research questions to determine this effectiveness:

1. To what types of computer technology applications do middle school principals have access?
2. What are the perceived levels of abilities of the middle school principal in regard to computer and keyboarding skills?

3. To what extent do differences exist in the skill levels of principals in demographic groupings?
4. To what extent are applications and programs are used by middle school principals?
5. Is there a difference in usage of technology among principals of different demographic variables?
6. Which administrative tasks are the most likely to be completed by computer management tools?
7. How do principals perceive computer technology affects their ability to perform specific job responsibilities?
8. To what extent do differences in perception of how job effectiveness is affected by technology exist among middle school principals of different demographic variables?

Research Design

Public school principals from schools in Virginia and West Virginia that are identified as middle schools were selected to participate in this survey. To participate, principals completed an electronic version of the *Perceptions of Technology on Job Effectiveness* survey developed by Dr. John Stephen May. Permission to use the survey was acknowledged by Dr. May with a letter of permission from the researcher and the dissertation committee.

Population and Sample

The study population included principals of public schools in Virginia and West Virginia identified as middle schools by the respective departments of

education. West Virginia identified 158 middle schools, drawn from 55 county-based districts, and Virginia identified 307 middle schools in 134 identified districts for a total of 465 schools. Rosters of school names and principals were provided by the two state departments of education.

Public schools in West Virginia are county-based and divided into eight educational units known as Regional Educational Service Agencies (RESAs). The purpose of these agencies is to serve school systems as coordinators with other state school systems, departments, and agencies. Each RESA provides a range of services to administrators, including technical assistance to individual schools for repair and installation services. Public schools in Virginia are designated from county or area-based districts.

Instrumentation

The study used the *Perceptions of Technology on Job Effectiveness* (PTJE) survey developed by John Stephen May. May developed this survey instrument for a 2003 research project in partial fulfillment of degree requirements for Northern Illinois University. The survey defines four specific components as related to school administrators: (a) demographic information of the respondent, (b) respondent's level of access to technology, (c) the amount of computer and computer-based applications usage respondents had in their position, and (d) identification and usage of the computer and computerized programs school administrators related to their job effectiveness.

The *Perceptions of Technology on Job Effectiveness* survey used a five-point Likert scale to measure participants' usage of computer applications and

relationships of computer technology with a variety of administrative tasks, and a rating overall computer skills and keyboarding skills. A four-point Likert scale was used to measure the impact of computer technology and leadership concepts. *Yes* or *No* responses were used to measure the principals' perceptions of how technology applications affected job effectiveness, as well as overall perceptions of computer technology. The demographic portion of the survey was modified from an instrument that measured responses of high school principals to one that measured the responses of middle school principals.

Reliability and Validity of the Instrument

Reliability, the consistency of the instrument to provide the researcher with the same results (Ritchie, 2000), was measured in the initial creation of the instrument. Reliability was tested by Dr. Marilyn Kuliecke, of the original researcher's home district, Illinois District 214, in 2002. Using a Chronbach Alpha test on responses returned from the initial study by Dr. May, Dr. Kuliecke reported a reliability of .963, which scored the instrument to the category of "excellent reliability" (May, 2003). In 2008, the instrument was reviewed by the current dissertation committee to assess reliability.

The validity of the instrument was also measured by Dr. Kuliecke and a group of four former principals from the Illinois district. The group used the instrument as it was developed for a mass survey, and then identified items that needed clarification. Each respondent reviewed the survey for content and methods of application. The survey was also reviewed by members of the current dissertation committee for relevance to the purpose of the survey.

Data Collection

The collection of data was completed using the PTJE survey. An electronic letter of communication was sent to each identified principal along with the survey instrument. Principals were identified by creating a database of all schools identified as middle schools in Virginia and West Virginia. One hundred school principals from each state were randomly chosen to create a sample. This quantitative survey was sent to the identified school principals electronically in the spring of 2009. After a seven-day period, a follow-up communication and second copy of the survey was sent electronically to non-respondents, followed by a third request and survey 14 days after the initial posting of the survey.

Data Analysis

Quantitative analysis using SPSS 17.0 was completed for each question from the survey. Demographic responses in Section One were disaggregated according to the provided categories. Additional data from Section One regarding technological access was analyzed using Kruskal-Wallis tests for yes/no answers. Likert scale responses were measured using frequencies, modes, medians, means, and standard deviations. Ancillary findings related to demographic information were analyzed with one-way ANOVA procedures to ascertain significance. Data analyses were reported and displayed in figures, tables, and narrative descriptions.

CHAPTER FOUR: FINDINGS

Introduction

Chapter Four presents the research data of this quantitative study including findings, statistical research, and narrative descriptions related to the survey results. The study was created to measure the usage of computer technology by middle school principals in both Virginia and West Virginia, the type of computer programs and applications the principals use, the extent to which these programs and applications are used, and which identified administrative tasks are related to computer technology usage by the administrator. In addition, the study examined the principals' perceptions about the various computer programs and their related impact on their ability to perform administrative tasks and overall job effectiveness.

Population and Sample

The population for this study consisted of 465 middle school principals in Virginia and West Virginia. A sample of 100 principals from each state was randomly selected a total of 200 principals was surveyed with a random return rate of 101 principals needed for a 50% plus one return rate. The actual return was 104 surveys resulting in a 52% return rate. The return was in response to multiple survey e-mails.

Of the 200 selected principals, 37 responded to the initial e-mailing of the *Perceptions of Technology on Job Effectiveness* for an 18.5 % response of the sample population. A reminder letter was sent to the principals one week later to non-opting out respondents and 41 responses were collected for a total of 78

responses and a 39% cumulative response rate. A second e-mail reminder resulted in 26 responses for a total response rate of 52%, and the survey was closed. Of the 200 surveys sent, several respondents did not complete all questions, although all surveys were completed with more than 95% responses. In addition, five respondents opted out of the survey and three participants did not participate due to district policies concerning unapproved surveys.

Table 1

Descriptive Demographic Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
State Demographics	103	1.00	2.00	1.3204	0.46891
WV-VA					
Gender	102	1.00	2.00	1.3725	0.48587
Age	102	2.00	9.00	5.3922	1.61157
Current Work Setting	103	1.00	3.00	2.4272	0.72222
Administrative Experience	102	1.00	6.00	2.2941	1.47982
Years in Current Position	103	1.00	6.00	1.5146	0.98880
Level of Education	104	1.00	4.00	2.2788	0.68912

Statistical examination of the demographic information revealed more of the respondents were from West Virginia (68.2 %) than Virginia (31.8%) , more were male (62.7%) than female (37.3%), and almost half were either 51-55 years of age (28.4%) or 56-60 years of age (20.6%). Respondents identified themselves as predominately rural (57%) with less than ten years experience as principal (66.7%); the majority of principals reported 1-5 years experience (39.2%) or 6-10 years (27.5%) experience. The majority of respondents had ten years or less in their current setting with 1-5 years experience (70.9%) or 6-10 years (19.4%).

Seventy-seven principals had masters degrees (74%), while 18 reported an Education Specialist certification (17.3%), 9 (8.7%) reported doctorates, and 5 principals reported a baccalaureate level of education.

All respondents stated they had computer access at work, with the majority (99%) using Windows-based units (PCs) as opposed to Apple/Macintosh computers. Almost all principals had a computer at home (98.1%), but only 48 (46.2%) reported having access to the school's district network information from home.

Research Design

The study used the *Perceptions of Technology on Job Effectiveness* survey developed by John Stephen May in 2003 as an instrument for research in partial fulfillment of degree requirements for Northern Illinois University. The quantitative survey defined four specific components as related to school administrators: (a) demographic information of the respondent, (b) respondent's level of access to technology (c) the amount of computer usage respondents had in their position on a daily and weekly basis, and (d) identification of computer and computerized programs school administrators related to their job.

The *Perceptions of Technology on Job Effectiveness* survey used a five-point Likert scale to measure participants' usage of computer applications and relationships of computer technology with a variety of administrative tasks, and a rating overall computer skills and keyboarding skills. A four-point Likert scale was used to measure the impact of computer technology and leadership concepts. *Yes* or *no* responses were used to measure the principals' perceptions of how

technology applications affected job effectiveness as well as overall perceptions of computer technology.

The demographic portion of the survey had been modified from an instrument that measured responses of high school principals to one that measured the responses of middle school principals. The survey was reformatted to allow for electronic presentation as compared to the original paper format which was mailed to participants in the 2003 study.

Research Questions and Findings

Quantitative methods were used to answer the following questions regarding a school administrator's interaction with and perceptions about technology usage in relation to job effectiveness:

1. What computer technology applications are available to middle school principals?
2. What are the perceived levels of abilities of the middle school principal in regard to computer and keyboarding skills?
3. To what extent do differences exist in the skill levels of principals in demographic groupings?
4. To what extent are applications and programs are used by middle school principals?
5. Is there a difference in usage of technology among principals of different demographic variables?
6. Which administrative tasks are the most likely to be completed by computer management tools?

7. How do principals perceive computer technology affects their ability to perform specific job responsibilities?
8. To what extent do differences in perception of how job effectiveness is affected by technology exist among middle school principals with different demographic variables?

This section of the research is a presentation of findings related with each of the following questions:

Question 1. What computer technology applications are available to middle school principals?

Participants were asked to identify the access to a variety of identified computer applications that may be used in the course of administrative duties. Respondents were given seven different applications to consider: (a) Access to the Internet, (b) Access to e-mail, (c) Access to word-processing programs, (d) Access to spreadsheets, (e) Access to informational databases, (f) Access to presentation software, such as PowerPoint, and (g) Access to publishing software, used for newsletter-type information, etc.

The level of access was measured by principals answering each of the applications with an answer of “Yes” or “No”. Of the seven questions relating to the applications, five of the applications (Internet, e-mail, word processing, spreadsheets, and publishing software) had 104 responses while Application 5 (databases) had 101 responses and Application 6 (presentation software) had 102 responses.

Responses to access of Applications 1-4 and 6, (Internet, e-mail, word processing, spreadsheets, and presentation software) were reported with 100% of “Yes” responses. Application 5 (databases) had 97 “Yes” responses and four “No” responses for a 96% yes response rate. Application 7 (publishing software) had 98 “Yes” responses and 6 “No” responses for a 92.4% “Yes” response rate. Mean (M) scores for all responses was 1.0, with the exception of Applications 5 and 7, which had means of 1.03 and 1.05, respectively. Detailed responses, mean scores and standard deviations for each of the statements representing access to computer applications are displayed in Table 2.

Table 2
Principals’ Access to Types of Computer Programs

Access to Type of Program	Yes	No	Total	M	Stand. Dev.
Internet	104	0	104	1.00	0.000
E-Mail	104	0	104	1.00	0.000
Word Processing	104	0	104	1.00	0.000
Spreadsheets	104	0	104	1.00	0.000
Databases	97	4	101	1.03	0.196
Presentation Software	102	0	102	1.00	0.000
Publishing Software	98	6	104	1.05	0.234

All statistical information was created by SPSS 17.0. Inferential data for relating areas of significance was created by implementing a Kruskal-Wallis test of independent samples. Only three of the seven applications—access to spreadsheets, databases and publishing software—showed significance in the distribution of scores. Application 4 (spreadsheets) had 1 chi-square score of 100.038, Application 5 (databases) had a score of 85.634 and Application 7 (publishing software), had a score of 81.385. All three of the applications had a

significance of .000. Applications 1-4 and 6 showed no variance of distribution.

Table 3

Principals' Access to Types of Computer Programs

Access to Type of Program	N	Yes	Chi-Square	df	Sig.
Internet	104	104	0*	1	
E-Mail	104	104	0*	1	
Word Proc.	104	104	0*	1	
Spreadsheets	104	104	100.038	1	.000**
Databases	101	97	85.634	1	.000**
Presentation	102	102	0*	1	
Publishing	104	98	81.385	1	.000**

* Distribution had no variance

** Significant at the 0.05 level

Question 2. What are the perceived levels of abilities of the middle school principal in regard to computer and keyboarding skills?

Participants were asked to identify their skills using the computer and the computer keyboard. A five-point Likert scale was used to measure respondent's skill level. The survey questions asked respondents to rate both their computer and keyboarding skills as "Poor" (point value=1), "Fair"(2), "Average" (3), "Above Average" (4) and "Excellent" (5). The statement regarding computer skills had 104 responses, and the keyboarding question had 102 responses. There was a mean score of 3.65 for participants rating their computer skills and 3.41 for keyboarding skills. The mode for both groups was 4, with computer skills having a median of 4 and keyboarding skills a 3. Descriptive information including number of responses, mode, median, mean, and standard deviations are included in Table 4.

Table 4*Principals' Perceived Level of Skills*

	N	Mode	Median	Mean	Std. Deviation
Computer Skills	104	4.00	4.00	3.6538	0.84496
Keyboarding Skills	102	4.00	3.00	3.4135	1.12008

For complete distribution of responses, A Kruskal-Wallis test was used to measure frequencies of responses. In rating personal computer skills, “Poor” had 1 response with 1 % of the total; “Fair” had 7 responses (6.7%); “Average” had 34 responses (32.7%); “Above Average” had 47 responses (45.2%); “Excellent” had 15 responses (14.4%). A listing of the responses and percentages of their perceptions of computer skills is presented in Table 5.

Table 5*Principals' Perception of Computer Skills*

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Poor	1	1.0	1.0	1.0
Fair	7	6.7	6.7	7.7
Average	34	32.7	32.7	40.4
Above average	47	45.2	45.2	85.6
Excellent	15	14.4	14.4	100.0
Total	104	100.0	100.0	

In rating personal keyboarding skills, “Poor” had 4 responses with 3.8 % of the total, “Fair” had 20 responses (19.2%), “Average” had 29 responses (27.9%), “Above Average” had 31 responses (29.8%), and “Excellent” had 29

responses (19.2%). A list of the responses and percentage of their perceptions of keyboarding skills is presented in Table 6.

Table 6
Principals' Perception of Keyboarding Skills

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Poor	4	3.8	3.8	3.8
Fair	20	19.2	19.2	23.1
Average	29	27.9	27.9	51.0
Above average	31	29.8	29.8	80.8
Excellent	20	19.2	19.2	100.0
Total	104	100.0	100.0	

Question 3. To what extent do differences exist in the skill levels of principals in demographic groupings?

Research into the identified demographic groupings was investigated to see if differences were noted in how the principals reported computer and keyboarding skills. A chi-square cross tabulation of variables was used to identify significance of the groups.

Demographic groups included State Residence, Gender, Age, Work Setting, Years Experience, Years in Current Setting, and Level of Education. The Kruskal-Wallis test revealed no significance in overall computer skills in any of the seven demographic grouping. The lowest score of significance was in the category of “Gender” while the highest level of significance was from the category of “Years in Current Setting”.

Table 7***Principals' Computer Skills by Demographical Grouping***

Category	N	Chi-Square	df	Sig.
State	104	5.56	1	0.234
Gender	104	5.82	1	0.211
Age	104	30.3	8	0.348
Work Setting	104	4.91	2	0.767
Years	104	21.65	5	0.359
Experience				
Years in Current	104	10.43	5	0.843
Setting				
Education Level	104	12.74	3	0.386

*Significant at the 0.05 level.

A chi-square cross-tabulation of variables was used to identify significance of the groups. The Kruskal-Wallis test revealed significance of overall keyboarding skills in one of the seven demographic grouping. As with overall computer skill data, the lowest score of significance was in the category of “Gender” while the highest level of significance was from the category of “Years in Current Setting”.

Table 8***Principals' Keyboarding Skills by Demographical Grouping***

Category	N	Chi-Square	df	Sig.
State	103	3.30	1	0.508
Gender	102	17.62	1	0.001*
Age	102	39.14	8	0.079
Work Setting	103	4.72	2	0.787
Years	102	24.24	5	0.232
Experience				
Years in Current	1043	9.39	5	0.896
Setting				
Education Level	104	11.62	3	0.476

*Significant at the 0.05 level.

Two categories were included in the gender demographic: “Male” and “Female”. There were 64 male respondent and 38 female respondents. The category of “Poor” had 3 male responses and 1 female response, the category of “Fair” had 19 male responses and 1 female response, “Average” had 20 male and 8 female responses, “Above Average” had 14 male and 17 female responses, and “Excellent” had 8 male and 11 female responses. All gender-related keyboarding responses are displayed in Table 9.

Table 9
Keyboarding Skills by Gender

		Keyboarding Skills					Total
		poor	fair	average	above average	excellent	
Gender	male	3	19	20	14	8	64
	female	1	1	8	17	11	38
Total		4	20	28	31	19	102

Question 4. To what extent are applications and programs used by middle school principals?

Participants were asked to rate the level of usage of a variety of computer applications. Six computer applications were listed for the survey: (a) Internet, (b) e-mail, (c) word processing, (d) databases, (e) spreadsheets and (f) presentations. A five-point Likert scale was used to measure respondent’s usage levels. The survey questions had five possible responses as levels of usage and related point values: (a) “Never”=1, (b) “Monthly”=2, (c) “Weekly”=3, (d) “Daily”=4, and (e) “Not Applicable” (N/A) having no point value. A range of 1.0-4.0 was possible for assessing the mean score for each identified computer application.

Internet usage had the highest mean score with 3.95. The usage of e-mail had a mean score of 3.89, word processing 3.67, database 2.89, spreadsheets 2.58, and presentation materials at 2.22. Standard deviations had a lesser variability in Internet, e-mail and word-processing usage than in the frequency usage of databases, spreadsheets and presentation applications. All statistical information for frequency of usage is in Table 10.

Table 10
Frequency of Usage Statistical Information

	Mode	Median	Mean	Mean Error	SD
Internet	4	4	3.9519	0.035	0.403
E-mail	4	4	3.8922	0.055	0.561
Word Proc	4	4	3.6731	0.064	0.660
Databases	3	3	2.8932	0.093	1.23
Spreadsheets	3	3	2.5865	0.093	0.951
Presentations	2	2	2.2233	0.079	0.803

*Significant at 0.05.

Principals rated each application according to the level of usage. The category of “Daily” was ranked highest in usage level for Internet, e-mail and word processing. The “Weekly” category was ranked as the highest level of usage for both databases and spreadsheets, while “Monthly” had the highest rating for presentation applications.

Table 11
Principals' Frequency of Usage

	Never	Monthly	Weekly	Daily	N/A	Total
Internet	0	0	1	102	1	104
E-mail	1	2	0	98	1	102
Word Proc	2	5	18	79	0	104
Databases	7	32	35	28	1	103
Spreadsheets	8	35	41	17	3	104
Presentation	6	62	25	6	4	103
Software						

Question 5. Is there a difference in usage of technology among principals of different demographic groups?

Participants were asked to rate the level of usage of a variety of computer-based technologies including “Usage of the Internet”, “E-mail”, “Word Processing”, “Databases”, “Spreadsheets”, and “Presentation Materials”. A cross tabulated chi-square was used to discover if significance existed in identified demographic categories, including State Residence, Gender, Respondent’s Age, Type of Work Setting, Total Years Experience as a Principal, Years Experience in Current Setting, and Level of Education. A description of responses is presented in Tables 12-17.

Table 12***Principals' Demographical Internet Usage***

Category	Chi-Square	df	Sig.
State	0.962	1	0.618
Gender	2.28	1	0.320
Age	21.5	8	0.088
Work Setting	7.18	2	0.126
Years Experience	9.70	15	0.467
Years in Current Setting	0.919	5	0.999
Education Level	0.827	3	0.991

*Significance at 0.05

For Internet usage, no significance was found in the demographic areas. Significance was highest in the demographic of Gender (0.088). The least amount of significance was found in the categories of Years in Current Administrative Setting 0(.999) and Level of Education (0.991).

Table 13***Principals' Demographical E-Mail Usage***

Category	Chi-Square	df	Sig.
State	3.551	1	0.314
Gender	2.377	1	0.498
Age	18.78	8	0.405
Work Setting	9.217	2	0.162
Years Experience	13.36	5	0.574
Years in Current Setting	9.88	5	0.626
Education Level	27.86	3	0.001*

*Significance at 0.05

For e-mail usage, significance was found in one demographic area, Level of Education (0.001). The least amount of significance was found in the categories of Years in Current Administrative Setting (0.626) and Total Years Experience (0.574).

Table 14
Principals' Demographical Word Processing Usage

Category	Chi-Square	df	Sig.
State	2.123	1	0.547
Gender	5.565	1	0.135
Age	17.59	8	0.675
Work Setting	3.256	2	0.776
Years Experience	28.51	5	0.019*
Years in Current Setting	8.784	5	0.721
Education Level	8.410	3	0.493

*Significance at 0.05

For word processing usage, significance was found in one demographic area, Total Years Experience (0.019). The least amount of significance was found in the categories of Work Setting (0.776) and Years in Current Setting (0.721).

Table 15
Principals' Demographical Database Usage

Category	Chi-Square	df	Sig.
State	8.080	1	0.089
Gender	1.397	1	0.845
Age	24.01	8	0.460
Work Setting	2.625	2	0.956
Years Experience	30.98	5	0.055
Years in Current Setting	11.87	5	0.753
Education Level	12.39	3	0.414

*Significance at 0.05

For database usage, no significance was found in the demographic areas. Significance was greatest in the demographic of Total Years Experience (0.055)

and State Residence (0.089). The least amount of significance was found in the categories of Work Setting (0.956) and Gender (0.845).

Table 16
Principals' Demographical Spreadsheet Usage

Category	Chi-Square	df	Sig.
State	2.248	1	0.690
Gender	2.442	1	0.655
Age	34.83	8	0.175
Work Setting	6.158	2	0.630
Years Experience	14.60	5	0.798
Years in Current Setting	11.99	5	0.744
Education Level	14.78	3	0.253

*Significance at 0.05

For spreadsheet usage, no significance was found in the demographic areas. The category closest to significance was in the demographic of Age (0.175). The least amount of significance was found in the categories of Years Experience as a principal (.798) and Years in Current Setting (.744).

Table 17
Principals' Demographical Presentation Software Usage

Category	Chi-Square	df	Sig.
State	3.357	1	0.500
Gender	6.291	1	0.178
Age	44.44	8	0.025*
Work Setting	11.15	2	0.193
Years Experience	19.38	5	0.497
Years in Current Setting	21.31	5	0.167
Education Level	16.97	3	0.151

*Significance at 0.05

For presentation software usage, significance was found in the demographic area of Age (0.025). The least amount of significance was found in the categories of State Residence (0.500) and Total Years Experience (0.497).

Question 6. Which administrative tasks are the most likely to be completed by computer management tools?

Participants were asked to rate a variety of administrative tasks to measure which activities were most likely to be related to the use of computer technology. Respondents were surveyed on ten administrative tasks and were given a five point Likert scale to rate each one.

The survey questions had five possible responses as levels of usage and related point values: (a) “Never”=1, (b) “Monthly”=2, (c) “Weekly”=3, (d) “Daily”=4, and (e) “Not Applicable” (N/A) having no point value. A range of 1.0-4.0 was possible for assessing the mean score for each identified computer application.

There were 12 identified administrative tasks for participants to rate to be related to computer technology: (a) Attendance Taking, (b) Finance, (c) Discipline, (d) Newsletters, (e) Staff Memos, (f) Student Letters, (g) Parent Letters, (h) Data Collection, (i) Internet Research, (j) Teacher Evaluations, (k) Curriculum Issues, and (l) Policy Issues. Detailed responses including mean, median, mode, and standard deviations—are provided in Table 18.

Table 18
Computer Usage and Administrative Tasks

	N	Median	Mode	Mean	Std. Deviation
Attendance Taking	104	2.00	4.00	2.3301	1.57423
Finance	104	2.00	3.00	2.1731	1.27289
Discipline	104	4.00	4.00	3.4951	0.75243
Newsletters	104	2.00	2.00	2.2330	0.78220
Staff Memos	104	3.00	3.00	3.3558	0.65238
Student Letters	104	2.00	2.00	2.2981	0.95409
Parent Letters	103	2.00	2.00	2.4369	0.73658
Data Collection	104	3.00	2.00	2.7308	1.01666
Internet Research	104	3.00	3.00	3.0577	0.84563
Teacher Evaluations	104	2.00	2.00	2.3077	0.84849
Curriculum Issues	104	3.00	3.00	2.7308	0.81528
Policy issues	104	3.00	3.00	2.5577	0.70816

Mean scores were highest for Discipline (3.49), Staff Memos (3.35), and Internet Research (3.05), and the three categories were the only categories to score above a 3.0. The category of Finance (2.17) had the lowest of the mean scores, followed by Newsletters (2.23) and Student Letters (2.29).

A mode score of 4.0 was reported in two categories, Attendance Taking and Discipline, while five categories had a mode of 3.0 and six categories had a mode of 2.0. Attendance Taking, Finance and Data Collection had the greatest variability of responses, while Staff Memos, Policy Issues and Parent Letters had the lowest variability in of responses.

A summative frequency distribution was created by using SPSS 17.0 for computer usage with identified administrative tasks. Table 19 presents the frequency of responses for each of the five response categories.

Table 19
Frequency of Computer Usage with Administrative Tasks

Category	Never (%)	Monthly (%)	Weekly (%)	Daily (%)	N/A (%)	Total
Attendance Taking	38 (36.5%)	4 (3.8%)	6 (5.8%)	44 (42.3%)	11 (10.6%)	104
Finance	28 (26.9)	18 (17.3)	30 (28.8)	18 (17.3)	10 (9.6)	104
Discipline	3 (2.9)	7 (6.7)	29 (27.9)	64 (61.5)	0 (0.0)	104
Newsletters	5 (4.8)	68 (65.4)	19 (18.3)	8 (7.7)	3 (2.9)	104
Staff Memos	1 (1.0)	7 (6.7)	50 (48.1)	46 (44.2)	0 (0.0)	104
Student Letters	12 (11.5)	43 (41.3)	35 (33.7)	9 (8.7)	5 (4.8)	104
Parent Letters	1 (1.0)	58 (55.8)	34 (32.7)	8 (7.7)	2 (1.9)	103
Data Collection	6 (5.8)	35 (33.7)	32 (30.8)	28 (26.8)	3 (2.9)	104
Internet Research	4 (3.8)	22 (21.2)	42 (40.4)	36 (36.6)	0 (0.0)	104
Teacher Evaluation	13 (12.5)	47 (45.2)	35 (33.7)	7 (6.7)	2 (1.9)	104
Curriculum Issues	2 (1.9)	40 (38.5)	42 (40.4)	19 (18.3)	1 (1.0)	104
Policy Issues	2 (1.9)	47 (45.2)	46 (44.2)	8 (7.7)	1 (1.0)	104

The highest “Daily” usages of computer applications were in the categories of Discipline (61.5%), Staff Memos (44.2%) and Attendance Taking (42.3%).

The lowest “Daily” usage was in Teacher Evaluation (6.7%), Parent Letters (7.7%) and Policy Issues (7.7%). The highest rated “Weekly” activities included Staff Memos (48.1%), Internet Research (40.4%), and Curriculum Issues (40.4%).

The highest rates for “Monthly” activities included Newsletters (65.4%), Parent Letters (55.8%) and Teacher Evaluation (45.2%). Four categories—Attendance Taking (36.5%), Finance (26.9%), Teacher Evaluation (12.5%) and Student

Letters (11.5%)—were the only categories with a ranking above 10% in the “Never” category.

Question 7. How do principals perceive computer technology affects their ability to perform specific job responsibilities?

Participants were asked to rate a variety of administrative tasks to measure how computer technology affected their specific job responsibilities. Respondents were surveyed on ten administrative tasks and were given a five point Likert scale to rate each one.

The survey questions had five possible responses as levels of usage and related point values: (a) “Never”=1, (b) “Rarely”=2, (c) “Sometimes”=3, (d) “Often”=4, and (e) “Not Applicable” (N/A)=0. A scoring range of 1.0-4.0 was possible for assessing the mean score for each identified computer application.

There were ten identified administrative responsibilities for participants to rate for usage of computer technology: (a) Gathering Data and Facts, (b) Seeking Knowledge about Policies, (c) Classifying and Organizing Information, (d) Identifying the Important Elements of a Problem, (e) Reaching Logical Conclusions and Making Logical Decisions, (f) Planning and Scheduling, (g) Assessing and Creating Staff Development Needs, (h) Facility Planning, (i) Teacher Evaluation and (j) Writing to a Variety of Audiences. Detailed responses—mean, median, mode, and standard deviations—are provided in Table 20.

Table 20
Computer Technology and Administrative Responsibilities

	N	Median	Mode	Mean	Std. Dev.
Gathering Data	104	4.00	4.00	3.6154	0.71472
Seeking Knowledge	104	4.00	4.00	3.4231	0.80884
Classifying Info	104	4.00	4.00	3.4615	0.73634
Identifying Problems	103	3.00	4.00	3.2816	0.82149
Reaching Conclusions	104	3.00	4.00	3.3173	0.86197
Planning Work Schedules	103	4.00	4.00	3.5146	0.88411
Assessing Professional Development	104	4.00	4.00	3.3462	0.80976
Facility Planning	103	3.00	3.00	2.9903	1.02417
Planning for Teacher Evaluations	104	3.00	4.00	3.2596	0.95526
Writing materials	104	3.00	4.00	3.5000	1.07034

Mean scores were highest for Gathering Data (3.61), Planning Work Schedules (3.51), and Writing Materials (3.50). Facility Planning (2.99) had the lowest of the mean scores, followed by Planning for Teacher Evaluations (3.25) and Identifying Problems (3.28). A mode score of 4.0 was reported in every category except Facility Planning. Median scores of 4 were reported in five of the categories including Gathering Data, Seeking Knowledge, Classifying Info, Planning Work Schedules and Assessing Professional Development. Writing Materials, Facility Planning and Planning for Teacher Evaluations had the greatest variability of responses, while Seeking Knowledge, Classifying Information and Gathering Data had the lowest variability in of responses.

A summative frequency distribution was created by using SPSS 17.0 for computer usage with identified administrative tasks. Table 21 presents the frequency of responses for each of the five response categories.

Table 21
Frequency of Computer Usage with Administrative Responsibilities

	Never (%)	Rarely (%)	Sometimes (%)	Often (%)	N/A (%)	Total responses.
Gathering Data	2 (1.9)	2 (1.9)	28 (26.9)	72 (69.2)	2 (1.9)	104
Seeking Knowledge	1 (1.0)	6 (5.8)	37 (35.6)	58 (55.8)	2 (1.9)	104
Classifying Info	1 (1.0)	6 (5.8)	37 (35.6)	59 (56.7)	1 (1.0)	104
Identifying Problems	1(1.0)	9 (8.7)	45 (43.3)	46 (44.2)	2 (1.9)	103
Reaching Conclusions	3(2.9)	6 (5.8)	42 (40.4)	51 (49.0)	2 (1.9)	104
Planning Work Schedules	2.(1.9)	3 (2.9)	26 (25.0)	69 (66.3)	3 (2.9)	103
Assessing Professional Development	0 (0)	10 (9.6)	40 (38.5)	52 (50.0)	2 (1.9)	104
Facility Planning	1 (1.0)	21 (20.2)	39 (37.5)	37 (35.6)	5 (4.8)	103
Planning for Teacher Evaluations	3. (2.9)	10 (9.6)	36 (34.6)	52 (50.0)	3 (2.9)	104
Writing materials	1 (1.0)	1 (1.0)	19 (18.3)	76 (73.1)	7 (6.7)	104

The highest ranking of “Often” in use of computer applications with administrative tasks was in the categories of Writing Materials to a Variety of Audiences (73.1%), Gathering Data (69.2 %), and Planning of Work Schedules (66.3%). The lowest usage rated in the “Often” category was in Facility Planning (35.6 %), Identifying Problems (44.2%), and Reaching Conclusions (49.0%). The highest rated activities with “Sometimes” usage included Identifying Problems (43.3%), Reaching Conclusions (40.4%), and Assessing Professional Development (38.5%). The highest rates for “Rarely” usage included Facility

Planning (20.2 %), Planning for Teacher Evaluations (9.6 %), and Assessing Professional Development (9.6%). No category had a ranking higher than 2.9% (Reaching Conclusions) at the “Never” level.

Question 8. To what extent do differences in perception of how job effectiveness is affected by technology exist among middle school principals with different demographic variables?

Principals were asked to assess a variety of computer applications and if the use of the application contributed to improved administrative performance. Respondents were given seven different applications to consider: (a) Internet, (b) E-mail, (c) Word-Processing programs, (d) Spreadsheets, (e) Informational Databases, (f) Presentational Software such as PowerPoint, and (g) Publishing Software used for newsletter type information, etc. In addition, a summative question, “Do you believe the use of the computer has made you a more effective principal?” was included in the survey. The perceptions of principals relating to computer applications was measured by principals answering each of the application questions with an answer of “Yes” or “No”. None of the applications or overall effectiveness questions received a 100% affirmative answer.

Application 2, E-mail, was the only application to receive more than 100 “Yes” responses with 102 for a 98.1% response. Internet usage had 99 “Yes” responses for a 95.2% positive response, and Word-Processing applications had 96 positive responses with a 92% rate of response. All remaining applications had less than a 90% positive rate of responses: databases had 92 “Yes” responses and 12 “No” responses for an 88.8% yes response rate, Presentation Software had an 91 “Yes”

responses and 87.5% positive response, Spreadsheets had 90 “Yes” responses and an 86.5% positive response, and Publishing Software had 81 “Yes” responses for a 77% positive response rate. Cumulative median and mode scores were 1.0 for every application and overall perceptions of job effectiveness. Mean scores were highest for Presentation Software (1.12) and Spreadsheets (1.13) and lowest for E-mail and Internet usage. Standard deviation scores showed the lowest variability in E-mail, Internet and Word-Processing, with the greatest variability in Publishing Software, Spreadsheets and Presentation Software.

Participants had 100 “Yes” responses and 4 “No” responses to the relationship of computer usage and overall job effectiveness for a 96.2 % positive response rate. Median and mode scores were both 1.0 and the mean score was 1.03. There was a standard deviation of 1.93, the second lowest variability of all scores reported for this question. Detailed responses, mean scores and standard deviations representing computer applications and job effectiveness are displayed in Table 22.

Table 22
Principals’ Perception of Computer Applications and Job Effectiveness

Category	Yes (%)	No	Median	Mode	Mean	Std. Dev.
Internet	99 (95.2)	5	1.00	1.00	1.0481	0.21492
E-Mail	102 (98.1)	2	1.00	1.00	1.0192	0.13800
Word Processing	96 (92.3)	8	1.00	1.00	1.0769	0.26776
Spreadsheets	90 (86.5)	14	1.00	1.00	1.1346	0.34297
Databases	92 (88.8)	12	1.00	1.00	1.1154	0.32103
Presentation Software	91 (87.5)	13	1.00	1.00	1.1250	0.33232
Publishing Software	81 (77.0)	23	1.00	1.00	1.2212	0.41703
Use of the Computer	100 (96.2)	4	1.00	1.00	1.0385	0.19324

A cross tabulation chi-square test was used to rate the significance of responses relating to computer applications, job effectiveness, and demographic information. Detailed responses, percentages, and significance scores are presented in Table 23.

Table 23
Principals' Perception of Computer Technology and Job Effectiveness

Category	Yes (%)	N	Chi-Square	df	Sig.
All Principals	100 (96.1)	104	88.6	1	0.000*
State	99 (96.1)	103	0.617	1	0.432
Gender	98 (94.2)	102	0.267	1	0.605
Age	98 (94.2)	102	4.55	8	0.714
Work Setting	99 (96.1)	103	1.90	2	0.385
Years Experience	98 (94.2)	102	24.1	5	0.000*
Years in Current Setting	99 (96.1)	103	0.510	4	0.973
Education Level	100 (96.1)	104	1.99	3	0.573

*Significance at 0.05

Response scores were highest in the categories of All Principals and Education Level. Five demographic categories had a percentage score of 96.1% including All Principals, State Residence, Work Setting, Years in Current Setting, and Education Level. The three remaining categories had a 94.2% positive rate of response. Significance was shown between All Principals and Years Experience and the principals' perception of job effectiveness.

Ancillary Findings

The *Perceptions of Technology on Job Effectiveness* survey included primary demographic data including State Residence, Gender, Age, Work Setting,

Years as a Principal, Years in Current Administrative Setting, and Level of Education. Additional information included the principal having access to a computer at work, the number of hours a week the computer is used by the principal at work, and the number of years the principal had been using the computer in the work setting. The type of computer used at work, the availability of a computer at home, and if so, and the availability of using the home computer to access a school-based network of information were also surveyed. The primary demographic data was used in Research Questions 3, 5, and 8 to ascertain skill levels, program usage, and perceptions of job effectiveness. The remaining demographical data was used to ascertain relationships with job effectiveness and is reported in the following sections.

Computer at Work

All participants, 104 respondents (100%), reported having access to a computer at their primary work site. An analysis of the data using a one-way ANOVA showed no significance between having a computer at work and job effectiveness.

Types of Computer at Work

A total of 103 respondents responded to the question, “What platform are you using?” with three possible responses: (a) Macintosh, (b) PC and, (c) No access. Only 1 participant reported using a Macintosh (1%) and 102 respondents (99%) reported using a PC. No participants reported no computer access. An analysis of the data using a one-way ANOVA showed no significance between the type of computer used at work and job effectiveness.

Weekly Computer Usage

A total of 103 (99%) participants responded to the survey question “How many hours a week do you use the computer?” with a range of nine categories of weekly usage. In terms of usage, respondents 3 (2.9%) reported using the computer 1-5 hours per week, 16 respondents (15.4%) used the computers 6-10 hours per week, 24 (23.1%) respondents used the computer 11-15 hours per week, 20 respondents (19.2%) reported using the computer 16-20 hours per week, 21 respondents (20.2%) reported using the computer 21-25 hours per week, 8 respondents (7.7%) reported using the computers 26-30 hours per week, 2 respondents (1.9%) reported using the computer 31-35 hours per week, 2 participants (1.9%) reported using the computer 36-40 hours per week and 7 (6.7%) respondents reported using the computer more than 40 hours per week. An analysis of the data using a one-way ANOVA showed no significance between the number of hours a principal used the computer and their perception of job effectiveness.

Years Experience Using a Computer

A total of 103 (99%) participants responded to the survey question “How many years have you been using a computer in your work setting?” with a range of six categories of years of usage. In terms of experience, 7 respondents (6.7%) reported using the computer 1-5 years, 25 respondents (24%) used the computers 6-10 years, 33 (31.7%) respondents used the computer 11-15 years, 17 respondents (16.3%) reported using the computer 16-20 hours per week, 13

respondents (12.5%) reported using the computer 21-25 years, and 8 respondents (7.7%) reported using the computers 26 or more years.

An analysis of the data using a one-way ANOVA showed no significance between the numbers of hours a principal used the computer and their perception of how the computer affected job effectiveness.

Computer at Home

A total of 104 (100%) participants responded to the survey question “Do you have a computer workstation/laptop at home?” with responses of “Yes” or “No”. One hundred and two respondents (98.1%) reported having a computer at home and 2 respondents (1.9%) had no computer at home.

An analysis of the data using a one-way ANOVA showed no significance between the having a computer at home and their perception of how computer the affected job effectiveness.

Access to Information From Home

A total of 104 (100%) participants responded to the survey question “Does your home computer give you access to your school’s network?” with three responses: “Yes”, “No”, and “I have no computer at home”. In terms of home access, 48 respondents (46.2%) reported having home access to a school network, 54 respondents (51.9%) reported no access at home, and 2 respondents (1.9%) reported not having a computer at home.

An analysis of the data using a one-way ANOVA showed no significance between principals having home access to a school network and their perception of how the computer affected job effectiveness.

Summary

This chapter presented the statistical analyses of data from the *Perceptions of Technology on Job Effectiveness* survey. The survey was completed by 104 middle school principals from Virginia and West Virginia with a 52% return rate.

The *Perceptions of Technology on Job Effectiveness* survey used a five-point Likert scale to measure participants' usage of computer applications and relationships of computer technology with a variety of administrative tasks, and a rating of overall computer and keyboarding skills. A four-point Likert scale was used to measure the impact of computer technology and leadership concepts. Yes or no responses were used to measure the principals' perceptions of how technology applications affected job effectiveness as well as overall perceptions of computer technology. Demographic material included State Residence, Gender, Age, Work Setting, Years as a Principal, Years in Current Administrative Setting, and Level of Education.

After collecting and collating of the data, SPSS 17.0 was implemented to calculate a variety of descriptive statistics. Frequencies, percentages, mode, median, mean scores and standard deviations were calculated and chi-square and ANOVA tests were used to determine statistical significance.

CHAPTER FIVE: SUMMARY AND DISCUSSION

Introduction

In the last 15 years, the role of technology in education has progressed with great rapidity. As the use and application of computer and computer technologies grow, it is important for educators to maintain and hone technological skills (Turner, 2005). As the primary leader of a school, it is incumbent for the principal to develop technological skills to serve as a leader, role model and effective consumer of a variety of technologies.

As the world in and out of the school setting becomes more technologically integrated, both students and parents have increased expectations for public education to reflect the technological realities and activities that have become prevalent in the home and workplace. It is up to the principal to meet these demands to effectively implement computer-based technology for schools and communities (Slowinski, 2005). However, the changing nature of the principal's duties has created challenges for successful technology implementation and usage. Buck (2007) noted this with a description of the principal's duties:

The principalship has changed in a variety of ways and the infusion of technology ranks near the top of the list. Today's principal . . . must deal with a steady flow of e-mail, telephone and cell phone messages while computers churn out data of every kind. Managing technology is a skill today's principals must practice and constantly hone. Technology is here

to stay, and we must either learn how to manage it or find ourselves being managed by it (p. 39).

This chapter presents conclusions regarding the perception of middle school principals of computer technology, its use and applications, and how computer technology affects job effectiveness. A narrative description of the findings of the *Perceptions of Technology on Job Effectiveness* survey is included, with implications for action and recommendations for further research also presented.

Research Questions

The purpose of this study was to assess the level of usage of computer technology by middle school principals in Virginia and West Virginia. The use of computer technology, its program applications to administrative tasks, and the ways in which principals view the computer and its applications in relation to their ability to perform their jobs effectively were analyzed for importance. Quantitative methods were used to answer the following questions regarding a school administrator's interaction with and perceptions about technology usage in relation to job effectiveness:

1. What computer technology applications are available to middle school principals?
2. What are the perceived levels of abilities of the middle school principal in regard to computer and keyboarding skills?

3. To what extent do differences exist in the skill levels of principals in demographic groupings?
4. To what extent are applications and programs used by middle school principals?
5. Is there a difference in usage of technology among principals of different demographic groups?
6. Which administrative tasks are the most likely to be related to computer technology?
7. How do principals perceive computer technology affects their ability to perform specific job responsibilities?
8. To what extent do differences in perception of how job effectiveness is affected by technology exist among middle school principals of different demographic variables?

Methods

The study used the *Perceptions of Technology on Job Effectiveness* (PTJE) survey developed by John Stephen May in 2003 as an instrument for research in partial fulfillment of degree requirements for Northern Illinois University. The quantitative survey defined four specific components related to school administrators: (a) demographic information of the respondent, (b) respondent's level of access to technology (c) the amount of computer usage respondents had in their position on a daily and weekly basis, and (d) identification of computer programs school administrators related to their job.

The demographic portion of the survey was modified from an instrument that measured responses of high school principals to one that measured the responses of middle school principals. The survey was reformatted to allow for electronic presentation as compared the original paper format that was mailed to participants.

The data were analyzed using SPSS 17.0. Descriptive statistics, frequencies, median, mode, means, and standard deviations were used to show usage levels of applications and principals' perceived level of effectiveness. Statistical analyses were collected through the Kruskal-Wallis test and a cross-tabulated chi-square test. An Analysis of Variance (ANOVA) and the Kruskal-Wallis tests were used to determine if ancillary demographic items could determine significance between factors such as access to a computer at school, hours spent working on the computer at school, years of experience with the computer, access to a computer at home, and access to the school network from home had any significance to the principals' perception of job effectiveness. A p value of 0.05 was used throughout the study to determine significance.

Demographics

The population for this study consisted of 465 middle school principals in Virginia and West Virginia. A random sample of 100 principals from each state was randomly selected for a total of 200 principals to be surveyed with a return rate of 101 principals needed for a 50% plus one rate of return. The actual return was 104 surveys resulting in a 52% return rate. This return was in response to multiple survey e-mails.

Of the 200 selected principals, 37 responded to the initial e-mailing of the survey, for an 18.5 % response of the sample population. An electronic letter of reminder was sent to the principals one week later to non-opting out respondents, and 41 responses were completed for a total of 78 responses and a 39% response rate total. The final 26 responses came from a second e-mail reminder for a total response rate of 52%, and the survey was closed. Of the 200 surveys sent, some respondents did not complete all questions of the survey, although all surveys were completed with more than 95% of completed responses. Five respondents opted out of the survey, and three others notified the researcher they could not participate due to district policies concerning unapproved surveys. The subtraction of this number of nonparticipating responders created a cumulative rate of 104 respondents from 192 possible participants for a response rate of 54%.

Of the respondents, 33 were from Virginia, for a representation of 31.7%. West Virginia had 71 respondents for a 68.3% response. All respondents who opted out were from Virginia, as were those who did not participate due to district policy.

Summary of Findings

Analyses of the data from the *Perceptions of Technology on Job Effectiveness* survey showed connections to the findings and literature related to the use of computer technology. Major findings and relations to the literature are provided.

Middle school principals have a high level of access to the computer and a variety of computer applications. Analyses of the data showed that 100%

of the principals surveyed had access to a computer on a daily basis. The principals also claimed overwhelmingly, with a 100% response, to have access to the internet, e-mail communications, word-processing programs, spreadsheets, and presentation software. Ninety-six percent of principals reported access to database programs, and 94% reported access to publishing software.

Middle school principals have differing perceptions of personal technology skills. The principals rated their computer skills higher than keyboarding skills. Overall, 92.3 % of the principals rated their computer skills in the categories of “Average”, “Above Average”, or “Excellent”. Only 7.7% of respondents rated their skills as “Fair” and one respondent rated personal computer skills as “Poor”.

The level of perceived computer skills contrasted to perceptions of keyboarding skills. The principals had a 77 % “Average” to “Excellent” rating of keyboarding skills. Twenty-three percent rated themselves in the “Poor” or “Fair” categories, a 15.3% difference from their perceptions of their computer skills.

There were differences in skill levels of a variety of demographic groups as well. The survey identified seven demographic groupings for study: State Residence, Gender, Age, Type of Work Setting, Years Experience, Number of Years in Current Administrative Setting, and Level of Education. A Kruskal-Wallis test revealed no significance for computers skills and significance in only one category of keyboarding skills: Gender, with a significance of .001. A statistical analysis of the category showed that 22 of 64 male principals (34%)

rated themselves in the “Poor” or “Fair” categories, while only 2 of 38 female principals (0.05%) did so.

There is a difference in the level of usage of computer applications by principals. Using a five-point Likert scale, principals were asked to rate their level of usage of six computer applications. The survey questions had five possible responses as levels of usage and related point values: (a) “Never”=1, (b) “Monthly”=2, (c) “Weekly”=3, (d) “Daily”=4, and (e) “Not Applicable” (N/A) = 0. A scoring range of 1.0-4.0 was possible for assessing the mean score for each identified computer application.

Three applications had the highest rating for daily usage: Internet (102 responses), E-mail (98), and Word-Processing (79). Two applications, Spreadsheets and Databases, were highest in the “Weekly” category with 41 and 35 responses. Presentation Software, was rated highest for “Monthly” usage with 62 responses in this category. One category, Internet use, had no responses for the “Never” category; E-mail had one and Word-Processing had two such responses.

A cross-tabulated chi-square test was used to determine if there was significance in application usage for each identified demographic area. For internet usage, no significance was found in the demographic areas. The greatest rate of significance was in the demographic of Gender. The least amount of significance was found in the categories of Years in Current Administrative Setting and Level of Education. For e-mail usage, significance was found in one demographic area, Level of Education. The least amount of significance was

found in the categories of Years in Current Administrative Setting and Total Years Experience.

For word-processing usage, significance was found in one demographic area, Total Years Experience. A second area of near-significance was in the demographic category of Gender. The least amount of significance was found in the categories of Work Setting and Years in Current Setting.

For database usage, no significance was found in the demographic areas. Significance was highest in the demographics of Total Years Experience and State Residence. The least amount of significance was found in the categories of Work Setting and Gender. For spreadsheet usage, no significance was found in any of the demographic areas. The category of highest significance was in the Age demographic. The least amount of significance was found in the categories of Years Experience as a Principal and Years in Current Setting. For presentation software usage, significance was found in the demographic area of Age. The least amount of significance was found in the categories of State Residence and Total Years Experience.

Some administrative tasks are more likely to be related to computer technology than others. Participants were asked to rate 12 administrative tasks to measure how often computer technology affected their specific job responsibilities. The survey questions had five possible responses as levels of usage and related point values: (a) “Never”=1, (b) “Monthly”=2, (c) “Weekly”=3, (d) “Daily”=4, and (e) “Not Applicable” (N/A) having no point value. A range of

1.0-4.0 was possible for assessing the mean score for each identified computer application.

The highest “Daily” uses of computer applications for administrative tasks were in the categories of Discipline, Writing of Staff Memos, and Taking Attendance. The lowest “Daily” usages were in Teacher Evaluation, Writing Letters to Parents, and Investigating Policy Issues. The highest rated “Weekly” activities included Writing Staff Memos, Conducting Internet Research, and Curriculum Issues. The highest rates for “Monthly” activities included newsletters letters to parents and teacher evaluations. Four categories—attendance taking, finance, teacher evaluation, and letters to students—were the only categories with a ranking above 10% in the “Never” category.

Many administrative responsibilities are not highly utilized through computer technology. Participants were asked to rate a variety of administrative tasks to measure how computer technology affected their specific job responsibilities. Respondents were surveyed on ten administrative tasks and used a five-point Likert scale to rate timely usage.

There were ten identified administrative responsibilities for participants to rate for usage of computer technology: (a) Gathering Data and Facts, (b) Seeking Knowledge about Policies, (c) Classifying and Organizing Information, (d) Identifying the Important Elements of a Problem, (e) Reaching Logical Conclusions and Making Logical Decisions, (f) Planning and Scheduling, (g) Assessing and Creating Staff Development Needs, (h) Facility Planning, (i) Teacher Evaluation, and (j) Writing to a Variety of Audiences. The survey

questions had five possible responses as levels of usage and related point values: (a) “Never”=1, (b) “Rarely”=2, (c) “Sometimes”=3, (d) “Often”=4, and (e) “Not Applicable” (N/A) having no point value. A range of 1.0-4.0 was possible for assessing the mean score for each identified computer application.

The administrative duties that had the highest “Often” usage were Using Writing Materials (73.1%) and Gathering Data (69.2%). The lowest rankings were for Facility Planning (35.6%) and Identifying Problems (44.2%). The highest rated activities in the category of “Sometimes” were Identifying Problems, Reaching Conclusions, and Assessing Professional Development. The categories of highest ratings for “Rarely” included Facility Planning, Planning for Teacher Evaluations, and Assessing Professional Development. No category had a ranking higher than 2.9% at the “Never” level.

Principals perceive computer technology positively affects job performance and effectiveness. Principals were asked if, overall, computer technology had made them a more effective principal. Principals had 100 “Yes” answers and 4 “No” answers to this question with a 96.2% positive response rate. In addition, principals were asked to assess a variety of computer applications and if the use of the application contributed to improved administrative performance. Respondents were given seven different applications to consider: (a) Internet, (b) E-mail, (c) Word-Processing programs, (d) Spreadsheets, (e) Informational Databases, (f) Presentational Software such as PowerPoint, and (g) Publishing Software, used for newsletter type information, and other administrative writings.

E-mail was identified as the application that most greatly affected job performance, with a 98.1% level of “Yes” responses. Internet usage had a 95.2% positive response, and Word-Processing applications had a 92% positive rate of response. All remaining applications had less than a 90% positive rate of responses. Databases had an 88.8% “Yes” response rate, Presentation software had an 87.5% positive response rate, Spreadsheets had an 86.5% positive response rate, and Publishing Software had the lowest “Yes” rating, 77%.

Ancillary Findings

Ancillary findings included secondary demographic data not used in the research questions. All groupings were analyzed for frequencies and descriptive data. An analysis of the data using a one-way ANOVA was used to show significance between six demographic groups and the relationship of computer usage and job effectiveness.

Ancillary information included the following: (a) the principal having access to a computer at work, (b) the number of hours a week the computer is used by the principal at work, and (c) the number of years the principal had been using the computer in the work setting. Also, (d) the type of computer used at work, (e) the availability of a computer at home and if so, (e) the availability of using the home computer to access a school-based network of information were surveyed.

All participants, 104 respondents (100%), reported to having access to a computer at their primary work site. A total of 102 respondents identified a PC as the computer platform they used; one participant reported using an

Apple/Macintosh and one participant did not respond to the question. No participants responded as have no access to a computer at work.

The principals' weekly computer usage was measured by the survey question, "How many hours a week do you use the computer?" Three respondents (2.9%) reported using the computer 1-5 hours per week, 16 respondents (15.4%) used the computers 6-10 hours per week, 24 (23.1%) respondents used the computer 11-15 hours per week, 20 respondents (19.2%) reported using the computer 16-20 hours per week, 21 respondents (20.2%) reported using the computer 21-25 hours per week, 8 respondents (7.7%) reported using the computers 26-30 hours per week, 2 respondents (1.9%) reported using the computer 31-35 hours per week, 2 participants (1.9%) reported using the computer 36-40 hours per week, and 7 respondents reported using the computer more than 40 hours per week, and one participant did not respond to the question.

A total of 103 (99%) participants responded to the survey question "How many years have you been using a computer in your work setting?" with a range of six categories of years of usage. Seven respondents (6.7%) reported they had used the computer for 1-5 years, 25 respondents (24%) had used computers for 6-10 years, 33 (31.7%) respondents had used the computer for 11-15 years, 17 respondents (16.3%) reported had used the computer for 16-20 hours per week, 13 respondents (12.5%) reported having used a computer for 21-25 years, and 8 respondents (7.7%) reported having used computers 26 or more years.

Principals responded to the survey question, “Do you have a computer workstation/laptop at home?” with a 98.1% “Yes” response rate, while 1.9% responded as having no computer at home.

All (104) participants responded to the survey question “Does your home computer give you access to your school’s network?” with a range of three categories including “Yes”, “No”, and “I have no computer at home”. In terms of home access, 46.2% of respondents reported having home access to a school network, 51.9 % of respondents reported no access at home, and 1.9 % of respondents reported not having a computer at home.

An analysis of the data using a one-way ANOVA was used to determine significance between any of the demographic groupings of principals and their perception of how the computer affected job effectiveness. No grouping showed significance below the p. level of 0.05.

Findings Related to the Literature

The analyses of data from the *Perceptions of Technology on Job Effectiveness* have shown how principals use and view computer technology. All principals reported having access to a computer at work with daily access to both the computer and computer applications. All principals noted that they had access to the Internet, e-mail and word-processing programs, spreadsheets, and presentation software. Responses detailed access to database and publishing software were higher than 94%. The findings show an increase from the findings of May (2003), who reported in 1993 that 90% of principals had access to computers and that 98.3 % of principals had access to computers at school. The

findings of this research contrasts with The National Center for Education Statistics that found only 56% of workers used the computers at their employment (2007).

Principals overwhelmingly believed the use of computers had made them a more effective principal, with 100 of 104 positive responses, an increase of 10% from May's (2003) research. Principals also stated that use of the computer applications had made them more effective in their job performance. Principals rated e-mail, (98.1%), Internet usage (95.2%), and word processing (92.3%) applications highest in relation to job effectiveness. In comparison, Brockmeir et al. (2005) found that school administrators chose a variety of technology usages to maximize job effectiveness, including using computers to affect student achievement (85%), to collect and analyze data (85%), to integrate the computer into curricular activities (84%), to streamline daily administrative tasks (80%), and to facilitate change as the greatest areas of computer technology needs to maximize job effectiveness.

Although all principals had access to computer technology, they were more confident in their computer skills than keyboarding skills. More than 92% of the respondents rated their computer skills as Average to Excellent, and only 77% of the principals reported keyboarding skills to be rated from Average to Excellent. These findings present an increase from the research of May (2003), which found that principals reported a 53% level of Average to Excellent computer skills and 55.4% Average to Excellent keyboarding skills.

In examining the differences in demographic groups, the Gender demographic was the only category showing significance. In this group, 34% of the males rated themselves as fair or poor in keyboarding skills, while only 0.05% of female principals responded to those rating categories. In comparison, 92.3 % of the principals rated their computer skills as average to excellent, and only one identified the computer skills as poor. This is in comparison with the findings of Afshari et al. (2008), who stated, “Principals have moderate competency in computer applications” (p. 6).

Studies of application usage show similarities of a variety of programs. Brown (2001) noted that e-mail was the most popularly used computer application, while Afshari, et al. found that principals identified e-mail and word processing as the most used applications (2008). Benson et al. reported word processing as the most used application (2000) and May (2003) reported communication duties to be the most used applications by principals.

Research from this study found similar results with internet usage, e-mail communication, and word processing as having the highest rate of usage, followed by the use of databases, spreadsheets, and presentation software. A study of the responses by different demographic groups showed significance in three groupings: there was significance (0.001) for respondents of differing levels of education using e-mail, principals of differing levels of experience using word processing (0.019), and principals of different ages using presentation software (0.025). These findings reflect the findings of the Bureau of Labor Statistics that the oldest and youngest workers are least likely to use the internet and that 61.8%

of females used the computer at work, while only 49.9% of males did so. Internet usage had a similar disparity with 45.1% of women online compared to 38.7% of men (2005).

A study of high school principals in Virginia noted eight work-based activities the administrators listed as important technological strengths: (a) printing information, (b) using the student database for information, (c) creating materials using word processing, (d) using a modem, (e) accessing e-mail, (f) getting information from CD-ROMs, (g) conducting Internet searches for information and, (h) using scheduling programs to create student and teacher schedules. Principals noted seven areas of weakness included using digital cameras, projecting budgetary issues and financial projections, spreadsheet usage, creating databases, and creating presentations via slideshow programs (Celata, 1998).

For this study, participants rated 12 administrative tasks related to levels of computer technology usage. Discipline, writing memos to staff, and attendance taking, were ranked highest for daily usage, followed by internet research, data collection, curriculum issues, finance, letters to students, newsletters, letters to parents, teacher evaluations, and policy issues. Four tasks were identified highly for no usage: attendance taking, finance, teacher evaluation, and letters to students.

Ten administrative duties were also included on the survey to measure how often principals used the technology in relation to completion of the duties. Gathering data, using writing materials, classifying information, seeking

knowledge and assessing professional development were the duties identified by more than half of the respondents as being used most often.

No identified duty was given a rating higher than 2.9% in the category of *Never*. These findings provide a positive comparison with Lecklider (2009), who found professional development to be the most identified need of principals, followed by student usage, technology access, teacher usage, and budgetary and financial issues.

Implications for Action

The results of this study provide important information and insight to assist the decision-making process of policymakers in Virginia and West Virginia, the respective Departments of Education, local school boards, institutions of higher education, national administrative groups, staff development offices, and those who design professional development. The high rate of computer technology usage in the principal's daily administrative activities, and 100% reported using internet-based information, e-mail communications and word-processing activities for administrative tasks, display a clear need for principals to have training in the use of computers and computer programs to maximize efficiency for task completion and improved job performance.

Based on the research from the study, it is imperative that middle school administrators and all school administrators would benefit from the following recommendations:

1. Staff development and training should be provided for all administrators in computer technology and a variety of job-related computer applications.
2. Guidelines should be developed for the funding of computer technology that is current and technologically advanced. Funding should be specific to administrators.
3. Guidelines should be clearly communicated for the expectations of computer technology usage and program applications.
4. Partnerships are to be created of the local, state, and higher education organizations to have the needs of school principals for computer-based technology identified and addressed at the graduate level.
5. Partnerships should be created of the local, state, and higher education organizations to provide computer-based technology training for new administrators as part of administrative mentoring programs.
6. Incentives and adequate time for administrators to learn and enhance use of computer-based applications should be provided in a variety of trainings that could include online courses as well as instructor led group settings.
7. Programs and opportunities for principals should be created to recognize principals as leaders of technology.

Recommendations for Further Research

As the educational leader in the school, the principal is expected to have advanced knowledge of strategic concepts and tools that will advance the overall achievement of students and assist the school in meeting identified goals. This research study has shown that computer technology usage by the school principal is pervasive, and perception of this usage is positive and useful for job effectiveness. However, this study creates questions that must be addressed by additional research. Recommendations for further research include the following:

1. This two-state study was developed from an earlier study that was regional in scope. To truly understand the breadth of computer usage and principals' perceptions of computer usage, a national study should be completed, with a larger number of participants.
2. The study was directed specifically to middle school principals. To effectively measure all principals' perceptions, research should include elementary and high school principals.
3. Additional research could also include assistant principals as a study group; these administrators traditionally have a different set of responsibilities in the school. Also, this research should differentiate between the perceptions of assistant principals who spend the greatest amount of time as disciplinarians and those identified and curriculum specialists.
4. Veteran administrators are viewed as least likely to embrace and use new technologies. Research specific to administrators of a certain

identified age or years of administrative experience could provide valuable information about this subset of administrators.

5. The quantitative component of this study did not include feedback or comments from participants. It would be of research interest to add a comment section for participants. It would also be of interest to interview principals who identified themselves with positive or negative outlooks of the technology.
6. This study was initially developed in 2003 and refers broadly to the types of computer applications addressed and used. It includes six different types of computer applications—word processing, databases, spreadsheets, Internet, e-mail, and presentation—and research could be directed to single components of the study. This single focus, combined with a qualitative aspect of the research, could provide greater depth and understanding of principals' perceptions and usage of each application.
7. A single examination of the role of computer technology in specific administrative tasks should be another focus of research. It is suggested research should examine the principal's usage and perception of usage of computer technology in regards to school communications, discipline, finance, or curriculum development as a single study component.
8. The research should be updated to include modern technologies not examined in the current study. The use and perception of technologies

and applications such as wikis, blogs, Twitters, cell-phones and data and music technologies such as MP3 players and I-pods are newer technologies that must be examined.

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APPENDIX A

Perceptions of Technology on Job Effectiveness (PTJE) Survey

Perceptions of Technology on Job Effectiveness

Demographic information:

1. a) Male b) Female
2. **Your Age:**
a) 26-30 b) 31-35 c) 36-40 d) 41-45 e) 46-50 f) 51-55 g) 56-60 h) 61-65 i) 66+
3. **Which of the following best describes the work setting you are in?**
a) Urban b) Suburban c) Rural
4. **Years as principal:**
a) 1-5 b) 6-10 c) 11-15 d) 16-20 e) 21-25 f) 25+
5. **Years in current position:**
a) 1-5 b) 6-10 c) 11-15 d) 16-20 e) 21-25 f) 25+
6. **Highest degree earned:**
a) Bachelor's b) Master's c) ED.S, CAS, or other post-master's degree d) Doctorate

Computer Usage Information:

7. Do you have access to a computer at your primary workstation? a) Yes b) No
 8. If yes, what platform are you using? a) Macintosh b) PC c) No access
- Please bubble in yes or no for each item that you have access to in your work area:**
9. Internet access a) Yes b) No
 10. E-mail a) Yes b) No
 11. Word Processing a) Yes b) No
 12. Spreadsheets a) Yes b) No
 13. Databases a) Yes b) No
 14. Presentation Software (PowerPoint, etc.) a) Yes b) No
 15. Publishing software (for creating newsletters, etc.) a) Yes b) No
16. Do you use a computer on a daily basis during the work week?
a) Yes b) No
17. If yes, how many hours a week do you use the computer for school-related tasks?
a) 1-5 b) 6-10 c) 11-15 d) 16-20 e) 21-25
f) 26-30 g) 31-35 h) 36-40 i) 41+
18. How many years have you been using a computer in your work setting?
a) 1-5 b) 6-10 c) 11-15 d) 16-20 e) 21-25 f) 25+

How often do you use the following software applications?

	a – N/A	b- Never	c – Monthly	d – Weekly	e - Daily
19. Word Processing	a	b	c	d	e
20. Databases	a	b	c	d	e
21. Spreadsheets	a	b	c	d	e
22. Internet	a	b	c	d	e
23. E-mail	a	b	c	d	e
24. Presentation Software	a	b	c	d	e

How often do you use the following computer applications in your daily tasks as principal?

	a-N/A	b-Never	c-Monthly	d-Weekly	e-Daily
25. Attendance taking	a	b	c	d	e
26. Finance	a	b	c	d	e
27. Discipline	a	b	c	d	e
28. Newsletters	a	b	c	d	e
29. Memos to staff	a	b	c	d	e
30. Letters to students	a	b	c	d	e
31. Letters to parents	a	b	c	d	e
32. Data Collection	a	b	c	d	e
33. Internet research	a	b	c	d	e
34. Teacher evaluationsa	b	c	d	e	
35. Curriculum issues	a	b	c	d	e
36. Policy issues	a	b	c	d	e

Rate each statement using the scale below:

	a- Poor	b- Fair	c- Average	d- Above Average	e- Excellent
37. I would rate my overall computer skills	a	b	c	d	e
38. I would rate my keyboarding/typing skills	a	b	c	d	e

Using the scale below, rate the impact that computer applications (including Internet access, email, word processing, spreadsheets, databases, and presentation software) have had on the following aspects of your principalship:

	a- No impact	b- Little impact	c- Moderate impact	d- High impact
39. Leadership	a	b	c	d
40. Decision making	a	b	c	d
41. Communication	a	b	c	d
42. Management	a	b	c	d
43. Curriculum issues	a	b	c	d
44. Teacher evaluation	a	b	c	d

**Do the following areas of technology allow you to be a better principal?
(mark the appropriate response)**

- 45. Internet access a) Yes b) No
- 46. E-mail a) Yes b) No
- 47. Word processing a) Yes b) No
- 48. Spreadsheets a) Yes b) No
- 49. Databases a) Yes b) No
- 50. Presentation software (PowerPoint, etc.) a) Yes b) No
- 51. Publishing software (for creating newsletters, etc.) a) Yes b) No

**Mark the appropriate response for each of the following items using this scale:
a- N/A b- Never c- Rarely d- Sometimes e- Often**

The use of computer technology assists my work as principal in:

- 52. Gathering data, facts, and impressions for a variety of sources about students, parents, staff members, administrators and community members. a b c d e
- 53. Seeking knowledge about policies, rules, laws, precedents or practices. a b c d e
- 54. Classifying and organizing information for use in decision making. a b c d e
- 55. Identifying the important elements of a problem situation by analyzing relevant information. a b c d e
- 56. Reaching logical conclusions and making high quality, timely decisions given the best available information. a b c d e
- 57. Planning and scheduling one's own and others' work so that resources are used appropriately and short- and long-term priorities and goals are met. a b c d e
- 58. Assessing and creating professional development needs of staff. a b c d e
- 59. Planning for the use of the physical plant. a b c d e
- 60. Providing guidance and input to teacher evaluation. a b c d e
- 61. Writing appropriately for various audiences, such as students, teachers, and parents. a b c d e

- 62. Do you have a computer workstation/laptop at home? a) Yes b) No

- 63. If you answered "yes" to Question 62, does your home computer give you access to your school's network?
a) Yes b) No c) I have no computer at home.
- 64. Do you believe that the use of a computer has made you a more effective principal?
a) Yes b) No

APPENDIX B

E-Mail Cover Letter to Participants

Notification Letter and Introductory E-mail

Subject: Principals Technology Usage Survey

Dear Principal:

I am J.M. Blackwell, a 2009 doctoral student at Marshall University Graduate College in South Charleston, West Virginia. I am requesting your assistance in a study of middle school principals in Virginia and West Virginia and usage of computer technology in administrative duties.

Your responses are of the utmost importance to this study. Responses will be confidential and no individual responses will be identified. Please answer all survey questions as accurately as possible and complete the survey by May 14, 2009. This survey should take fifteen minutes to complete.

Survey results will be reported as part of a dissertation study and may be used to affect decisions concerning professional development and administrative needs. If you would like a copy of the survey results, please forward a message to mblackwell@suddenlink.net. I may be contacted at 304-610-6680 if you have questions concerning the survey or its design.

As part of the survey, you will be asked to assign a PIN number to the survey. This number is assigned only for the purpose of sending follow-up surveys. To complete the survey go to <http://surveymonkey.com/saspx>. If you experience technical difficulties, please contact me immediately.

I understand the day of a middle school principal is often hectic and busy. I want to thank you for your participation and cooperation in the completion of this survey.

Sincerely,

J.M. Blackwell
Marshall University Graduate Student

APPENDIX C

E-Mail Reminder: One Week Follow-Up

Dear Principal:

Last week you received an e-mail concerning a survey of middle school principals and computer usage. You were randomly selected from a list of middle school principals in Virginia and West Virginia.

If you have completed the survey, I thank you. If you have not completed the survey yet, please do so by May 14, 2009. This information is of great importance and may have a significant impact on our knowledge of the skills and needs of middle school principals.

To access the survey, please click the following:
<http://www.surveymonkey.com/s.aspx>. Please remember to begin the survey with the provided PIN Number.

Thank you for your time and cooperation. If you have any questions or technical difficulties, please contact me at mblackwell@suddenlink.net.

Thank you,

J.M. Blackwell

APPENDIX D

E-Mail Reminder: Second Week Follow-Up

Dear Principal:

Please be reminded that you recently received an e-mail concerning a survey of middle school principals and computer usage. You were randomly selected from a list of middle school principals in Virginia and West Virginia.

If you have completed the survey, I thank you. If you have not completed the survey yet, please do so by May 14, 2009. This information is of great importance and may have a significant impact on our knowledge of the skills and needs of middle school principals.

To access the survey, please click the following:
<http://www.surveymonkey.com/s.aspx>. Please remember to begin the survey with the provided PIN Number.

Thank you for your time and cooperation. If you have any questions or technical difficulties, please contact me at mblackwell@suddenlink.net.

Thank you,

J.M. Blackwell

APPENDIX E

Letter for Consent of Usage



SELECT SCHOOL

DR. DAVID R. SCHULER
Superintendent

MR. LÁZARO J. LÓPEZ
Principal

MR. STEVEN R. KELLNER
Associate Principal

MR. R. BRIAN LICHTENBERGER
Associate Principal

DR. HOLLIS L. RAVITZ
Assistant Principal
Student Services

DR. STEPHEN J. MAY
Assistant Principal
Student Activities
and Driver Education

MS. DEBRA S. SWIERCZEK
Dean of Students

MR. RAMON D. WILLIAMS
Dean of Students

DIVISION HEADS

MR. JOHN A. ALDWORTH
English and Fine Arts

DR. MARY M. FURBUSH
Special Education

MS. EILEEN M. HART
Social Science, Foreign Language,
and ELL/Bilingual

MS. NANCY A. HEINTZ
Math and Science

MR. KEVIN M. MUCK
Business, Technology,
Life Science, Physical Education,
and Health



PRIDE IN PERFORMANCE

TOWNSHIP HIGH SCHOOL DISTRICT 214

WHEELING HIGH SCHOOL

900 South Elmhurst Road • Wheeling, Illinois 60090 • (847) 718-7000

October 10, 2008

Marshall University
Institutional Review Board

To Whom It May Concern:

I give James Blackwell, a doctoral student at your university permission to use the survey from my dissertation, The Impact of Technology on Job Effectiveness: Perceptions of High School Principals.

I give permission for James Blackwell to use the survey titled Perceptions of Technology on Job Effectiveness from my dissertation.

If you have any questions please do not hesitate to contact me at 847-718-7018 or e-mail me at steve.may@d214.org.

Sincerely,

Stephen J. May, Ed.D
Assistant Principal for Student Activities
Wheeling High School

Recognized for Excellence by the United States Office of Education
"An Equal Employment and Equal Education Opportunity Agency"



Office of Research Integrity
Institutional Review Board
401 11th St., Suite 1300
Huntington, WV 25701

FWA 00002704

IRB1 #00002205
IRB2 #00003206

April 3, 2009

Jerry Jones, Ed.D.
Leadership Studies, MUGC

RE: IRBNet ID# 106810-1
At: Marshall University Institutional Review Board #2 (Social/Behavioral)

Dear Dr. Jones:

Protocol Title:	[106810-1] Middle School Principals' Perception of the Effect of Technology on Job Effectiveness.	
Expiration Date:	April 2, 2010	
Site Location:	MUGC	
Type of Change:	New Project	APPROVED
Review Type:	Exempt Review	

In accordance with 45CFR46.101(b)(2), the above study and informed consent were granted Exempted approval today by the Marshall University Institutional Review Board #2 (Social/Behavioral) Chair for the period of 12 months. The approval will expire April 2, 2010. A continuing review request for this study must be submitted no later than 30 days prior to the expiration date.

This study is for student James Blackwell.

If you have any questions, please contact the Marshall University Institutional Review Board #2 (Social/Behavioral) Coordinator Bruce Day, CIP at (304) 696-4303 or day50@marshall.edu. Please include your study title and reference number in all correspondence with this office.

CURRICULUM VITAE

James M. Blackwell
Charleston, West Virginia 25314

Education

West Virginia Graduate College, M.A., Educational Leadership, 1996.
West Virginia Graduate College, M.A., Middle School Education, 1995.
West Virginia State College, B.A., English Education, 1989.
West Virginia University, B.S., Journalism, 1981.

Employment History

1989 to present	Kanawha County Schools Charleston, West Virginia <u>Administrator and Teacher</u>
1990	West Virginia Institute of Technology Athletic Department Montgomery, West Virginia <u>Director of Public Information</u>
1988-1987	West Virginia State College Institute, West Virginia <u>Editor, College Newspaper</u>
1988	Cambridge Career Products South Charleston, West Virginia

Staff Writer

1988-1982	Federal Express Corporation Charleston, West Virginia
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Presentations

2002	West Virginia Middle School Association “ <i>Characteristics of a Middle School</i> ”
2004	West Virginia Middle School Association “ <i>Merit Software and Student Achievement</i> ”
2005	West Virginia Middle School Association “ <i>Scheduling at the Middle School Level</i> ”
2008	National Middle School Association “ <i>Flip This School!</i> ”

Published Article

“Intervention that Adds Up: The Impact of Merit Software on Standardized Test Scores of Middle School Students.” Published by the Journal on School Education Technology. I-Manager Publications, Kerla, India. Summer 2006.