5-2006

Technology Proficiency Among K-12 Award-Nominated Teachers in Tennessee: A Survey of Teachers

Christopher John Greer
University of Tennessee - Knoxville

To the Graduate Council:

I am submitting herewith a dissertation written by Christopher John Greer entitled "Technology Proficiency Among K-12 Award-Nominated Teachers in Tennessee: A Survey of Teachers." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.

Edward L. Counts, Jr., Major Professor

We have read this dissertation and recommend its acceptance:

Norman E. Magden, Blanche W. O'Bannon, John R. Ray

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Anne Mayhew
Vice Chancellor and Dean of
Graduate Studies

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Technology Proficiency Among K-12 Award-Nominated Teachers in Tennessee: A Survey of Teachers

A Dissertation
Presented for the
Doctor of Philosophy Degree

The University of Tennessee, Knoxville

Christopher John Greer
May 2006

DEDICATION

This dissertation is dedicated to my parents,

Dr. John G. Greer

and

Dr. Bonnie B. Greer

as well as my fiancé,

Valerie M. Pulliam

Thank you for the support and encouragement that I needed to complete my education.

ACKNOWLEDGMENTS

I would like to express my sincerest gratitude to my doctoral committee chair, Dr. Edward Counts. His help and encouragement was very important throughout the dissertation process. I would also like to thank Dr. Blanche O'Bannon for the great deal of time she spent helping me with the content and focus of my study. I am very thankful to my remaining committee members: Dr. John Ray and Professor Norman Magden for their ideas and encouragement.

Finally, I would like to thank my parents, John and Bonnie, my sister, Tiffany, and my fiancé, Valerie who provided me with a great deal of encouragement throughout the process.

ABSTRACT

The integration of technology in K-12 classrooms is a prevalent topic among school faculty and administrations across the United States. There are many teachers that use technology in distinctive ways, whereas others are more reluctant to adopt technology into their teaching methods. The purpose of this study was to examine two groups of teachers in the state of Tennessee and explore how and why they use technology. The first group of teachers has been nominated for a Tennessee Teacher of the Year award over the past two years. The second group of teachers has never been nominated for the award. There were a total of 48 participants in this study.

The questionnaire attempted to assess the usage of technology resources in the classroom by K-12 teachers, as well as the perceived potential of technology as a teaching and learning supplement. The questionnaire gathered demographic information as well as technology use, including: 1) frequency of its use, 2) student use, 3) teacher use, both during instruction and for productivity, 4) how usage has changed over the past three years and 5) beliefs about its potential.

Major conclusions to the study were the following: 1) the award-nominated teachers use technology resources more frequently with their classes than their peers who have never been nominated; 2) both groups of participants have the same objectives for student technology use; 3) both groups of participants use technology resources for teaching as well as productivity; 4) both groups of participants have used technology resources similarly over the past three years, although the award-nominated teachers have more recently become comfortable with using technology resources; 5) both groups of

participants believe that technology offers a great deal of potential for instruction and learning.

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CHAPTER I

INTRODUCTION

Introduction

Over the past decade, technology has become a focal point for educators and school administrators across the United States. In 1994, only three percent of public school classrooms had an Internet connection; in more recent years, almost all schools have become connected to the Web (National Center for Educational Statistics, 2003). With costs related to computers and broadband connections decreasing, it has become quite affordable to equip classrooms with computers and online access. This access, in turn, provides students with new methods of accessing almost limitless amounts of information (Means, 2001). In order for teachers to fully utilize the Internet and other technology resources, some form of training is necessary. Most new teachers, as a part of their teacher preparation program, have had technology training before they enter the P-12 classroom as a teacher, whereas many seasoned teachers received their degrees before technology training was embraced as a part of the curriculum in university classrooms. To circumvent this disparity of technology proficiency, many schools offer professional development classes for teachers to receive needed technology training (Caverly and MacDonald, 2004).

While there has been a great deal of emphasis placed upon technology training and access, it is important to explore what type of teachers are more likely to adopt technology into their classrooms. Outstanding teachers are often looking for new ways to deliver content to their students; perhaps technology could be beneficial to them (Brand,

1998). It is worth noting that the reasons that educational technology proponents give for integration are analogous to the qualities that good teachers should possess, according to many researchers. Penuel, Yarnall, and Simkins (2000) found that project-based assignments, which lend themselves to a student-centered pedagogy, have had a very positive effect on critical thinking skills. Similarly, Murphy, Dellie, & Edwards (2004) state that good teachers are characterized as ones that facilitate student-centered instruction. By giving the teachers specific goals and experience with computers, the teachers are more likely to incorporate technology into their lesson plans (Wang, Ertmer and Newby, 2004).

Problem

The use of technology is a very important issue for school districts across the country (Emeagwali, 2004). Critics continue to address the advantages and disadvantages of this expanding area of education. Recent research has produced conflicting reports about the successes and failures of technology use, with some researchers stating technology integration is highly effective while other researchers find ambiguities in the overall success of technology resource use (Gilberti, 1999; Penuel et. al, 2000; Wicklein, 2004; Robertson, 2002).

Regardless of a teacher's beliefs about the benefits of technology use, it has become a ubiquitous component of pre-service teacher programs across the country. Federal grants like the PT3 (Preparing Tomorrow's Teachers to Use Technology) initiative have allowed teacher education programs to become actively involved in technology implementation in the P-12 curriculum (O'Bannon and Judge, 2004). Across

the United States, new teachers from the digital age are being hired into schools and the federally mandated No Child Left Behind (NCLB) program outlines a plan for technology integration, allowing teachers to put their technology skills to good use.

While there is now a great deal of emphasis on the use of technology resources in the classroom, many teachers are still reluctant to embrace these new means of content delivery. This presents a problem to school administrations that are developing curriculum, as well as to researchers, who continue to find inconsistencies when looking at the effectiveness of teaching when utilizing technology (Wicklein, 2004). Sandholtz and Reilly (2004) believe that the emphasis on technology skills is taking away from the fundamentals of P-12 instruction, which are: curriculum development, evaluating learning materials and thinking about how to provide better learning opportunities for students. This raises an interesting question: are Tennessee Teacher of the Year (TTOY) award-nominated teachers, who have been recognized as outstanding professionals, likely to adopt this new medium for content delivery? If so, how does their use of technology in the classroom compare with their peers who have never been nominated for the award?

Purpose

Each year, teachers across the United States are acknowledged for being outstanding in their field. There is little research about the relationship between these teachers that have been recognized as being outstanding and their utilization of technology resources in the classroom. One of the last studies that investigated this area was conducted during the late 1990s by Betty Young (2001). Young surveyed 1,300 award-winning educators to determine their computer use. Though Young hypothesized

that computer usage would be more prevalent among the innovative educators, the survey results indicated that there was no apparent difference between the award-winning teachers and their peers. Because educational technology has evolved since that time, this study is an important indicator of how technology resources are being utilized in current classrooms. The purpose of this study was to examine the use of technology resources by teachers who have been nominated for the TTOY award as well as their peers who have never been nominated for the award. The results were analyzed to see if there is any significant difference between the groups.

The findings of this study will aid teachers, supervisors, and administrators in the planning of curriculum, specifically in the area of technology implementation in a P-12 classroom. Data from the survey can be used to assess the amount of technology that has been utilized by both the nominated and non-nominated teachers. The data is significant in determining just how important technology is when teaching material in a primary and secondary education environment, both during classroom instruction as well as for other professional applications.

Design of Study

This study is designed to answer two research questions:

1. What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on:
    a. Years of teaching
    b. Grade taught

c. Usage during instruction

d. Students' use of technology resources

e. Professional development

f. Beliefs about technology resources in education

g. Experience with technology over the past several years

2. To what extent do a sample of P-12 teachers who have been nominated for the Tennessee Teacher of the Year Award and a sample of P-12 teachers who have not been nominated for the Tennessee Teacher of the Year Award differ in the use technology resources in (a) their teaching and (b) their professional development?

A nationally validated questionnaire was adapted for this study. This nationally validated questionnaire was originally used for the *Teaching, Learning and Computing:1998* study that examined computer use among teachers across the United States (Becker, 1998). The original study was on a national scale and included questions about classroom pedagogy, as well as technology use. The pedagogy portion of the original study was disregarded when designing the survey.

After completing the surveys, the data from 48 volunteer respondents was analyzed using SPSS. The data was used to determine the use of technology resources by the respondents, as well as their beliefs about the benefits of technology resource use in the classroom.

Need for the Study

While there has been ample research on qualities that an outstanding teacher possesses, as well as the advantages and challenges of technology integration into P-12 curriculum, there is very little research on whether or not technology use in the classroom is a common trait for teachers who have been nominated for outstanding teaching awards.

Through surveys of selected Tennessee teachers, this research will provide educators with data that allows them to examine the use of technology resources in schools across the state of Tennessee, as well as the likelihood of award-nominated teachers using technology in their classrooms. This study also investigates the use of technology resources by award-nominated and non award-nominated teachers and determines if there is any relationship between the two groups of teachers.

Assumptions

a. All respondents answered the questionnaire truthfully, thoughtfully and honestly.
b. The questionnaire is a valid and reliable instrument.
c. The questionnaire was able to obtain the information to assess the amount of technology used in the classroom.
d. The surveyed school districts encompass the range of school systems in the state of Tennessee.
e. The award-nominated teachers that were surveyed are representative of the TTOY award-nominated teachers.

f. The peers of the award-nominated teachers that were surveyed are representative of the peers of the TTOY award-nominated teachers.

Limitations

a. The data used in this study were those reported by 48 participants who completed the survey and returned it and they may not represent the responses of teachers who did not return their surveys.
b. Data used in the study were self-reported by the participants. The study relied on participants to report truthfully and accurately about their use of technology resources.
c. Data used in the study represents teachers' perceptions of their own technology use.
d. Results of the study cannot be generalized beyond the state of Tennessee.

Delimitations

a. There were 48 participants in the study
b. The information collected through this study is limited by the use of one questionnaire.

Definition of Terms

The following definitions are used in the study:

Award-nominated teachers- Teachers who have been nominated for the Tennessee Teacher of the Year award over the past two years.

Broadband Connection – A high-speed connection to the Internet that exceeds a download speed of at least 128 kbps.

Constructivism – A learning theory which holds that learning is an active process of recreating knowledge.

Digital Divide – A term referring to the socio-economic gap between individuals who have access to computers and those who do not.

Educational Technology – The use of computers, media, and other forms of technology to enhance the learning process. Instructional technology is utilized in both the business and educational world in a variety of areas, including training, development, classroom education and distance learning.

No Child Left Behind – Act passed by Congress in 2001 and signed into law by President Bush in 2002. The act strives to improve the primary and secondary educational institutions in the United States.

Preparing Tomorrow's Teachers to Use Technology (PT3) - grants that were awarded to over 400 institutions that train teachers since 1999. The primary purpose of these grants is to facilitate the integration of technology in P-12 education. The grants are sponsored by the U.S. Department of Education.

Technology – Used interchangeably with the term "technology resources" throughout the study.

Technology Resources – Technology resources include: computers, the Internet, digital cameras, LCD projectors, scanners, electronic whiteboards, handheld PDAs, digital video cameras and computer software.

Tennessee Teacher of the Year Award (TTOY) – Annual award given to a teacher in the State of Tennessee who meets and exceeds a list of criteria. The teacher has to be certified with at least five years of full time experience.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The integration of technology resources has emerged as a new and exciting way of using technology as a tool to improve student learning. Duhaney (2000) states that "various technologies generate a greater level of interaction between and among teachers and students." However, he cautions against the use of technology unless it is "an integral part of the teaching and learning objectives." The Apple Classrooms of Tomorrow (ACOT) study that was conducted in the 1990s was a groundbreaking examination of technology integration in the schools. The findings pointed to a great deal of potential for student engagement and learning as well as teacher empowerment (Ringstaff, Yocam, & Marsh, 1996; Sandholtz, Ringstaff, & Dwyer, 1994). One of the most popular uses of technology resources in the P-12 environment is the use of the Internet. Today's students have access to almost limitless amounts of information on the World Wide Web, while at the same time there are many educators whom are unhappy with the lack of new machines in the classrooms, as well as a dearth of Internet connections (Means, 2001). The contrast between technology's potential and integration challenges has shaped the focus of educational technology research over the past decade.

Using Technology

As technology becomes more prevalent in P-12 classrooms, researchers are looking at how it is being used as well as the experiences that teachers are having with its

implementation. Penuel, Yarnall and Simkins (2000) found that technology-using students surpassed their non-technology-using peers in developing critical thinking skills. They note that strenuous, project-based projects can have a profound effect on students' critical thinking skills, eventually preparing them for standardized tests. The critical thinking classrooms in their study allowed the students to have greater control over the learning environment. The teacher acted as more of a coach or facilitator instead of a lecturer. Student engagement can also be positively influenced by technology integration. Technology can create student excitement in the classroom, facilitating greater interest and motivation in learning. Additionally, as students become more engaged with the technology, they experiment more, which leads to even greater engagement (Sandholtz, et. al., 1994).

There are many teachers around the country that use technology to make a difference in students' lives. For example, Rosemary Shaw, a computer teacher in Florida, indicates that technology levels the playing field for learners who are otherwise challenged by circumstances of life, including ESL students and others with learning disabilities. Superintendents are also taking technology very seriously. Timothy Jennings, the superintendent of Virginia Beach Public Schools, transformed the school district into a technological powerhouse in a few short years. Jennings believes that teacher technology training is paramount, as is the goal that technology should directly contribute to student achievement (Milone, 2002). Other research also indicates that teachers have positive beliefs about the use of technology in the classroom, including the potential for student motivation. Research shows that teachers believe technology can be a great motivational tool for the classroom (Gningue, 2003). In their study on technology use in

early childhood classrooms, Hertzog and Klein (2005) found that information and resources could be more readily accessed to facilitate the students' learning. Hertzog and Klein also believe that the market for technology resources is expanding and there will be more kid-friendly versions of popular software titles in the near future.

Technology can certainly make a difference in student achievement. Recently, Reimer and Moyer (2005) studied the effects of computer applets on learning mathematics. These applets are small pieces of software that can be run within an existing software program. Reimer and Murphy found that over half of the students in their study improved their test scores after using computer applets to learn about fractions. They concluded their study by stating that these computer applets are "an innovative and useful way to enhance mathematics teaching." After studying the use of technology in science classrooms, Rodrigues (2003) believes that technology has the potential to encourage autonomy, self-directed learning and learner ownership of the learning process. Rodrigues also believes that technology can provide an opportunity for teachers to be more creative with their teaching. These findings are further supported by Guerrero (2004).

Zhang and Deng (2004) conducted a study that compared student perceptions in a traditional classroom versus those in a classroom where content was delivered using multimedia. The students were surveyed after the courses were completed, and those enrolled in the course that utilized multimedia had a higher rate of satisfaction. The multimedia class was more student-centered and more interactive. It is interesting to note, however, that the effectiveness of the instructor was more important than the use of technology. This suggests that technology resources can be a great supplement, but the

success or failure of a class depends upon the instructor. A similar study conducted by Page (2002) looked at two mathematics classrooms, with one delivering content in a traditional manner and the other using technology to enrich the learning environment. All of the students in both classrooms were of low socioeconomic status. Page found that students in the technology-enriched classroom scored significantly higher in mathematics achievement than their peers in the traditional classroom. These studies confirm the findings of several other studies that have seen an improvement in student achievement when technology was used (Burns and Bozeman, 1981; Kulik, 1994, Ross et. al., 1989; Christmann et al., 1997; Mann and Shafer, 1997).

After providing laptops to a selected number of 5th, 6th and 7th graders laptops, Lowther, Morrison and Ross (2003) studied the effects of 24-hour laptop availability when compared to a control group of students that only had access to computers in the classroom. Lowther et. al. found that the laptop students were very positive about having the laptops and enjoyed having access to online resources, as well as creating and editing work. All of the students agreed that having access to the laptops contributed to higher-level thinking and writing, as well as cooperative learning. The control students had mixed reviews over whether or not the classroom computers had a profound impact on student learning, although the students were generally positive about the classroom computers. This study indicates that by having ongoing access to computers, learning outcomes can be impacted in a positive way.

Legislation

When the No Child Left Behind (NCLB) plan was signed into law by President Bush in January 2002, it contained several goals for reforming education within P-12 schools in the United States (Toward A New Golden Age In American Education--How the Internet, the Law and Today's Students Are Revolutionizing Expectations, 2004). One of these goals was to realize the promise of using technology in education. The No Child Left Behind plan attempts to address the lack of training and the lack of understanding of how computers can enrich the learning experience. The specific technology goals set forth by the plan (No Child Left Behind Act of 2001, Pub. L. No. 107-110, 115 Stat. 1425, 2002) are:

1) Primary Goal - The primary goal of this part is to improve student academic achievement through the use of technology in elementary schools and secondary schools.
2) Additional Goals - The additional goals of this part are the following:
    (a) To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability.
    (b) To encourage the effective integration of technology resources and systems with teacher training and curriculum development to establish research-based instructional methods that can be widely implemented as best practices by State educational agencies and local educational agencies.

Though the NCLB presents objectives to educators on how they should use technology in the classroom, it does not lay out standards that are grade-level specific. These specific standards could be very helpful to teachers who are unsure about what types of technology resources they should be using with their students.

Fortunately, guidelines have been created that aid in the integration of technology. The International Society for Technology in Education (ISTE) has developed

national standards, or NETS (National Educational Technology Standards). These NETS help administrators and teachers gauge where they should be with technology integration in the curriculum by providing profiles for student performance with technology (ISTE, 2000). The NETS are the foremost standards being used by P-12 and teacher education programs (Stuve & Cassady, 2005). According to ISTE (2000) the standards are divided into six components:

1. Technology Operations and Concepts
2. Planning and Designing Learning Environments and Experiences
3. Teaching, Learning, and the Curriculum
4. Assessment and Evaluation
5. Productivity and Professional Practice
6. Social, Ethical, Legal, and Human Issues

The ISTE NETS Project lists 10 essential conditions for successful teacher education programs: shared vision, access, skilled educators, professional development, technical assistance, content standards and curriculum resources, student-centered teaching, assessment, community support, and support policies. Research also shows that consistency with revision and support is an essential factor for implementing a successful and technology-rich educational program (Bucci, Cherup, Cunningham, Petrosino, 2003).

While the NETS are the benchmark standards for technology integration in the United States, there are still many school districts that are not addressing all of the NETS. Some researchers have found that the degree to which the standards are being used varies greatly from school to school (Barron, Kemker, Harmes, Kalaydjian, 2003). When implemented correctly, the NETS can be very beneficial to students of all ages and

backgrounds. The standards can provide students with equivalent learning experiences, regardless of race or socioeconomic backgrounds (Swain and Pearson, 2002).

This is not to say that pre-service technology classes should be entirely devoted to teaching the NETS to future teachers. Stuve and Cassady (2005) believe that simply informing pre-service teachers what the standards are is a surface level processing that will not yield optimal results. Instead, they recommend that teachers learn how to use technology within meaningful educational contexts. This point should not be taken lightly; teacher education programs need to focus not only on the standards, but on implementation ideas related to the teacher's licensure. Stuve and Cassady also find some room for improvement from the NETS profile. They believe that students do not progress in a linear fashion when learning technology, though the NETS are laid out under that assumption.

Teacher Training

While most P-12 schools have technology resources available in the classrooms, research shows that teachers are not always able to apply the technology in a meaningful way. During his research, McKenzie (2002) discovered that while schools have spent a large amount of money wiring classrooms, they often employ teachers who are unfamiliar with the application of technology. *Education Week's* "Technology Counts '99" (1999) also showed that teachers were not taking advantage of their networks. Additionally, many of the teachers reported feeling unprepared to use technology. Further, McKenzie (2002) states that some schools jumped right into the technology foray without considering support, inclination, philosophy, and readiness. Some teachers

have access to computers, but do not use them for classroom instruction. In a study conducted by Wilson, Notar and Yunker (2003), findings revealed that very few teachers reported using computers for instructional purposes. In fact, the vast majority of the teachers reported using their computers primarily for recording grades. While technology resources are available, much is not utilized for instruction.

Because of the mandates for technology integration in schools across the United States, pre-service programs at many universities include a technology component in the required teacher education classes. This component could not have come at a better time. Many pre-service teachers are not adequately prepared to use technology when they reach the classroom (Albee, 2003). A study conducted by the National Center for Educational Statistics (2000) showed that only one-third of full-time regular public school teachers reported feeling well-prepared or very well- prepared to use computers and the Internet in the classrooms. Surveys of preservice teachers showed that computer technology skills were listed most frequently as "skills to emphasize when preparing preservice teachers." MacKenzie (1999) found that to maximize the effectiveness of technology in the classroom, an explicit connection should be made between the technology and what is being taught.

Many colleges are making great strides in integrating technology into their teacher education programs (Duhaney, 2001). Duhaney reports that several of the colleges are collaborating with area schools to give preservice teachers a positive model of how technology can be integrated into the classroom. Also stressed is the importance of linking the technology to sound pedagogical theory instead of using technology just to be using it. Some programs are even creating online modules that are aligned with the

National Educational Technology Standards for Teachers, or NETS•T. These modules are intended to enhance traditional classroom instruction and provide teacher education students with technology integration ideas (Rowley, J., Dysard, G., & Arnold, J., 2005). After conducting a study of a technology implementation program based upon the ISTE standards, Bucci (2003) found that "students can and will create technology-enhanced lessons" if they are given time, assistance, technology and experience. In turn, they are able to meet the ISTE professional standards. McCannon and and Crews (2000) note that due to the emphasis on technology use in teacher education programs, new teachers can play a vital role in implementing technology in the classrooms, as well as helping administrators to overcome problems with staff development.

While pre-service teachers are getting instruction on technology applications, existing P-12 teachers may have trouble receiving proper training on technology integration issues. Jones (2001) notes that most teachers had not received the necessary training to incorporate technology in their classrooms. While professional development classes address this need for teacher technology training, a majority of teachers look for help from their peers (Jones, 2001). Jones also points out that 18 states do not require students to take educational technology classes to be eligible for a teaching license. This contradicts the nationwide push for technology integration in the schools. In a survey of 1,000 public school teachers, CDW-G (CDW-G, 2005) found that a majority of the teachers still lack the training needed to take advantage of many areas of technology. Of the teachers surveyed, only 25% reported that they were well trained on using instructional software in their classes. Integration ideas are also needed, with only 28% of teachers feeling well-prepared to integrate computers into lessons. Similarly, Gningue

(2003) found that teachers attending a professional development class were frustrated about the lack of materials and guidance on how to implement technology activities in the classroom. Interestingly, some research indicates that a majority of teachers are unaware of any software that really helps learning (Iding, M., Crosby, M., & Speitel, T., 2002). However, this is not from an unwillingness to utilize technology. The same survey recalls that 63% of the teachers surveyed would like to have one computer per student and incorporate technology usage into all aspects of their teaching.

Although there is a great deal of research that shows teachers are not receiving the training they need on technology resources, the National Center for Educational Statistics (1999) found that 78% of full-time teachers had received some form of educational technology training in their grade or subject area within the 12 months preceding the survey. This does provide some encouragement that teachers are receiving much needed training on technology resources. The study found that the overall percentage of teachers receiving training had increased substantially compared to five years prior, with 51% of teachers receiving educational technology training during that time period.

However, the U.S. Congress, Office of Technology Assessment (1995) discovered that professional development is one of the biggest obstacles for integrating technology into the classroom. McCannon and Crews (2000) assert that in-service teacher training is the main challenge that teachers face when trying to learn how to integrate technology in the classroom instead of using it solely for administrative tasks. By requiring its teachers to attend four technology workshops, Wake County, VA, is just one of many districts that are addressing the lack of teacher training. Other researchers have also found the need for professional development courses in technology (Penuel et al,

2000). Weiss and Pasley (2004) stress that professional development activities should have explicit goals, a supportive and challenging environment and assurance that the teachers are developing their understanding. Shelton and Jones (1996) suggest that the training and development should occur outside of the normal school day to allow the teachers to concentrate on the training objectives without the concern of normal school day demands.

There are many possible benefits for teachers through technology training, but the teachers need to be prepared for the requirements. Brand (1998) concludes his research by stating, "Teachers must possess the confidence, understanding, and skills to effectively incorporate technology into their teaching practices." A teacher's perceptions about the relevance of technology are very good predictors of whether or not the teacher will meet the desired objectives of professional development training (Kanaya, Light, & Culp, 2005). The authors indicate that professional development programs should build upon the knowledge that teachers already have, instead of dictating why they should commit themselves to the goals that the training sets forth. Schools should also be wary of forcing technology upon teachers and creating a situation where they use technology solely for the purpose of using it. This can create pedagogical problems in some classrooms. After studying the computer usage of 140 teachers in two high schools, Cuban, Kirkpatrick & Peck (2001) discovered that over 60% of the teachers reported their teaching had been positively changed due to their use of technology. However, findings also revealed that the teachers were using the technology infrequently and in limited ways. A similar study examined two classrooms to see how technology was benefiting the teachers (Goodison, 2003). While one classroom was successful in the

integration of technology into the curriculum, the other classroom found very little contribution from the technology, and perhaps was impeded by it. Goodison suggests that this is due, in part, to a lack of emphasis on curriculum during professional development classes. He proposes that training should be "learner-centered, knowledge-centered, assessment-centered and community-centered."

Research indicates that professional development can make a positive impact on teachers' use of technology. Apple Classrooms of Tomorrow (ACOT) Teacher Development Centers provided training to teachers on new technologies. Researchers saw a significant impact on teacher attitudes after the classes had ended (Ringstaff, Yocam, & Marsh, 1996). Teachers reported feeling an increase in their self-efficacy as well as a sense of empowerment. The teachers were once again learners and some took risks by trying new lessons or new technologies. After completing a professional development program, teachers are able to improve their technical skills and become more aware of pedagogical strategies that are made possible by using technology (Mouza, 2002). Additionally, a proper understanding of classroom software can be used in ways to support constructive learning and promote inquiry and project-based learning exercises (Aust, Newberry, O'Brien, & Thomas, 2005). A successful professional development program will do more than just present information on technology resources. Teachers' concerns about computing as well as their comfort level with technology should be assessed in order to provide custom tailored professional development, increasing the likelihood that the resources that are committed will lead to successful technology integration (Atkins & Vasu, 2000). In addition to hands-on

practice with technology, it is also very important to allow teachers to select technologies that integrate easily into their pedagogical style (Zhao, Pugh, Sheldon, & Byers, 2002).

While teachers receive the majority of attention when designing technology training, there are other areas that should be considered. In a recent study, Staples, Pugach, & Himes (2005) found that it is very important to prepare an entire school for technology integration, not just the teachers. The authors stress that technology integration, professional development and equipment acquisition need to all be looked at carefully in order to capitalize on the use of technology in a school. These findings are further supported by O'Bannon and Judge (2004). Additionally, technology specialists and consistent technology training are two key factors in facilitating a successful technology integration program (Atkins, & Vasu, 2000). The school principal also has a significant impact on the level of technology integration within a school. The amount of technology training of the principals can enable them to lead their schools in the technology integration process (Dawson & Rakes, 2003).

Over the past several years, researchers have tried to understand why some teachers are more likely to adopt technology in their classrooms. Albion (1999) believes that a teacher's self-efficacy beliefs are a very influential factor when it comes to integrating technology in their classrooms. Vannata and Fordham (2004) point out that technology training is very important for educators, however, a "willingness to commit one's time 'above and beyond the call of duty' and a risk-taking attitude are also essential." Wepner and Tao (2002) state that teachers "who work with technology need to be willing to take risks. They need to be flexible, and they need to know when and how to learn from other people." Teachers who are going to adopt technology need to be open to

learning and change. Windschitl and Sahl (2002) found that the integration of technology in classrooms is dependent partly upon a teacher's system of beliefs. If they feel that the technology will "create learning conditions that [are] congruent with their beliefs about learners and their needs" then the teacher is more open to technology integration. Furthermore, a few recent studies (Ertmer, Gopalakrishnan & Ross, 2001; Rakes, Flowers, Casey & Santana, 1999) have shown that there is a positive correlation between a teacher's acceptance of technology integration practices and constructivist practices in the classroom.

Time, attitudes and motivation are crucial factors in the successful adoption of technology into P-12 classrooms. Lack of time can be a large impediment of successful technology implementation (Cuban et. al., 2001; Windschitl & Sahl, 2002). Kadel (2005) further supports this notion, believing that for technology to be successfully implemented into a classroom, teachers need time, energy and openness to change. Teachers need to understand how technology is going to make a positive difference in their classrooms. Wepner and Tao (2002) point out that for teachers to adopt technology into their classrooms, they must spend much more time planning for instruction as well as devote time towards professional development. Teacher attitudes also play an integral role in the amount of technology is used in the classroom (McGrail, 2005). While doing research on English language teachers' attempts to integrate technology into the English classroom, McGrail discovered that there is a resistance to using technology just because the administration says they need to use it, without providing examples of how it can be used. It is very important for teachers to be provided with technology implementation ideas. Time spent with technology has a positive linear relationship with computer

achievement (Liu, Maddux, & Johnson, 2004) The researchers also found that the investment of time spent on learning computer technologies can be predicted by four variables: enjoyment, motivation, importance and freedom from anxiety. Perhaps there are other indicators that predict teachers' use of technology. Becker and Ravitz (2001) specify teacher attributes that contribute to the likelihood of classroom technology implementation. Teachers that have five to eight computers in their classroom, take a leadership role with peers, have a constructivist pedagogy and have a moderate level of computer expertise are more likely to utilize computers in the classroom.

Interestingly, the grade being taught might be a predictor of how much technology a teacher will use. Research indicates that elementary teachers are more likely to use technology with their students on a regular basis (Barron et al, 2003; Becker, Ravitz, Wong, 1999).

Technology Access

In order to keep teachers abreast of the latest technologies, as well as equip schools with up-to-date hardware and software, school districts are re-working budgets in favor of increased technology funding. However, many teachers feel that it isn't enough. Research has found that a lack of funding and readily available resources is inhibiting the implementation of technology in school systems across the country (Mathews & Guarino, 2000; CDW-G, 2005). While computers provide a venue content delivery and learning, schools are struggling with the cost of keeping up-to-date machines in the classrooms. In order to counter this, grants are available to help the schools with the financial difficulties presented by technology integration. Mathews and Guarino caution that technology

implementation should be carefully planned in order to maximize the funding that is available. Research has found that a teacher's early experiences with technology can lay the groundwork for professional development needs (Davenport & Smetana, 2004). In addition to funding concerns, many teachers still do not have enough computers for their students. In 2005, almost 75% of teachers report having only a few computers in their classrooms for their students to share (CDW-G, 2005).

Although challenges remain in providing students access to current technology resources, there are some indications that conditions are improving in the public schools across the United States. In 2001, the NCES reported that more than half of public schools have a broadband connection. In Fall 2003, the NCES reported that nearly 100 percent of public schools in the United States had access to the Internet, compared to only 35 percent in 1994 (National Center for Educational Statistics, 2003). This trend towards total Internet connectivity is an important step for technology implementation in the classroom.

In addition to hardware and software, it is becoming increasingly important to have technical support staff on site to deal with the technical difficulties that come with computer integration. Wepner and Tao (2002) found that teachers had concerns about on-the-spot technical assistance; they wanted support to help them meet the responsibilities that come with infusing technology in the classroom. Serim (2002) believes that if teachers have to wait weeks for an issue to be resolved, the viability of technology integration will suffer. He reports that one of the most common complaints among teachers is the inability to print. He concludes that without the ability to print, teachers

will abandon their computers. Again, this emphasizes the need for technical support at each school.

Outstanding Teachers

It is not easy to become a master teacher. Brophy and Good (1986) state that the most reliable findings about good teaching show that the classroom teacher is well organized, efficient, and task-oriented. Interestingly, the answer changes when the question is presented to teachers. Clark (1992) notes that teachers believe the key to good teaching does not have to do with management or decision-making, but in forming good relationships with students. Teachers also believe that enthusiasm and openness to admitting mistakes are also important characteristics. Interestingly, students have a slightly different viewpoint on what makes an outstanding teacher. Clark finds that students desire to be known, encouraged, respected and led. California (California Standards for the Teaching Profession, 1997) has developed six guidelines that teachers should aim for:

1. Creating and maintaining an effective environment for students
2. Understanding and organizing subject matter knowledge for student learning
3. Planning instruction and designing learning experiences for all students
4. Assessing student learning
5. Developing as a professional educator.
6. Demonstrates overall effective teaching

While doing a study on the quality of science and mathematics instruction at the high school level, Weiss and Pasley (2004) found that less than 20% of the lessons were intellectually rigorous. Does this point to a lack of quality teaching? Research has found that good teachers are characterized as ones that facilitate student-centered instruction

with happy students and a teacher that is moving about the classroom (Murphy, Dellie, & Edwards, 2004). Other characteristics include a teacher who is caring, patient, interesting, and polite.

When asked what makes a good teacher, Leon Litwack, a history teacher, responded that a good teacher stirs and challenges the intellect, deepening sensibilities and developing insights and imagination (Rosenzweig, 2001). He goes further to say that in "…the classroom, the beginning of wisdom for our students is when they are exposed to alternate viewpoints." Duffy (2002) notes that pre-service teachers need to recognize that there is more than one way to teach material. He believes that an outstanding teacher needs to use professional knowledge in a creatively resourceful manner. Perhaps this manner could be delivering content through technology resources?

Reading Teacher (2000) presents several characteristics of good teachers, including: strong content and pedagogical knowledge, a high rate of engagement in classrooms, strong motivational strategies, high expectations for student achievement and providing help to students who are having difficulty. Jenkins (2001) believes that good teachers should exhibit the following criteria:

1. A good teacher has to be a good salesman
2. A good teacher takes the child wherever he or she is and moves forward
3. A good teacher is a risk taker and disciplines with "tough love."
4. A good teacher must motivate and build up the student's self-esteem.
5. A good teacher must take a holistic approach in dealing with students.
6. A good teacher must be able to control his or her students using the "tough love" approach.
7. A good teacher must teach students the importance of education.

McEwan (2002) has her own list of effective teaching traits, believing that a good teacher is mission driven, passionate, positive, effective with instruction and has a substantive

intellectual life. Jensen (2003) believes that an excellent teacher will take the common traits of a good teacher and personify them, creating a unique and outstanding style of instruction.

Classroom management is also an important area that good teachers should concentrate on. After concluding their study, Weiss and Pasley (2004) established the following characteristics of a well-managed classroom:

1. Student engagement with the content
2. Culture conducive to learning
3. Equal access for all students
4. Effective questioning
5. Assistance in making sense of the content
6. Good instructional decisions by the teachers
7. Teacher preparation and support

When looking at the qualities of good teachers, one can make the argument that technology use could be an important characteristic in their classrooms. Good teachers are constantly on the lookout for methods to improve how they teach and the way students learn (Brand 1998). Perhaps teachers who are nominated for teaching awards are more likely to use computers in a variety of aspects. They might embrace technology as having a great deal of potential for content delivery. Award-nominated teachers might be more likely to adapt technology early, eager to find an innovative way to deliver content to their students.

A review of guidelines for Teacher of the Year awards in numerous states shows no requirements in the use of technology. According to the Tennessee Department of Education website (Teacher of the Year, 2005), technology use is not required for someone to be recognized as an outstanding teacher in Tennessee. The selection criteria are that an outstanding teacher should:

- Have a broad understanding of research-based models for effective teaching and of current trends and issues in education.
- Be facilitators of learning, skilled in implementing creative teaching strategies.
- Be able to show evidence of positive teacher effect over time, through formal and informal documentation of student performance.
- Be able to explain, discuss and defend a personal philosophy of teaching.
- Be poised, articulate, enthusiastic, and energetic.
- Be exceptionally dedicated, knowledgeable and skilled teachers.
- Have a superior ability to teach and to inspire in students a love of learning.
- Be recognized as leaders in the community as well as in the school.
- Show active involvement and leadership in professional development and extra-curricular activities.
- Inspire students of all backgrounds and abilities to learn.
- Have the respect and admiration of students, parents and colleagues.

Tennessee is not the only state that does not include technology use as a selection factor for Teacher of the Year. Mississippi (Mississippi Teacher Center, 2004) states that "The teacher should have a superior ability to inspire students, possess leadership capabilities, and be an active member of the community." Georgia (Recognition:Teacher of the Year Program, 2004) lists similar characteristics for their outstanding teacher award:

- A certified classroom teacher in pre-kindergarten through grade 12, including special education, physical education, art, music, and media specialists. (Counselors are not eligible).
- An exceptionally dedicated, knowledgeable, and skilled teacher who is planning to continue in active teaching status.
- A teacher who inspires students of all backgrounds and abilities to learn.
- A teacher who has the respect and admiration of students, parents, and colleagues.
- A teacher who plays an active and useful role in the community as well as in the school.
- A teacher who is poised and articulate and possesses the energy to withstand a taxing schedule.

In California (State Schools Chief O'Connell Announces Five California Teachers of the

Year 2004, 2003), the selection committee looks at criteria such as: teachers' rapport with students, classroom environment, presentation skills, use of appropriate teaching methods and their ability to adjust to last minute changes. Illinois ("Finalists," 2003) has a similar set of standards, with emphasis placed on: educational activities that improve student performance, excellence in the performance of duties including colleague collaboration, evidence of a positive effect on the school environment, leadership and/or evidence of going above and beyond normal duties. The criteria for New York Teacher of the Year are somewhat broader (Teacher Development Programs Unit, 2004). The nominee should have the respect and admiration of students, parents, faculty members, the school administration, and local business leaders. The nominee should also serve an active role in the community. Many other states select their teachers using the guidelines provided by the National Teacher of the Year program (Selection Process, 2004). These guidelines are:

- Inspire students of all backgrounds and abilities to learn
- Have the respect and admiration of students, parents and colleagues
- Play and active and useful role in the community as well as in school
- Be poised, articulate, and possess the energy to withstand a taxing schedule.

A majority of states use selection criteria that are very similar to the above characteristics. One can only assume that a good teacher is one that meets these standards for teaching excellence. After examining the selection criteria of all 50 states, technology use does not appear to be a requirement when nominating candidates for Teacher of the Year. Since technology resources are not mentioned, can one conclude that technology resources are not an important factor when selecting an outstanding teacher? Middle school teacher David Rosenstein earned Middle School Educator of the

Year award from Maryland's Council of Social Studies. One of the primary reasons he received this award was due to his development and implementation of a series of WebQuests for his 6th grade students ("Teacher's," 2003). Rosenstein explored new and creative teaching strategies utilizing modern technology and the Internet. Similarly, Deborah Metcalf received the Council for Exceptional Children's Clarissa Hug Teacher of the Year award in 2005, primarily for integrating technology into her classroom and making significant educational advancement with her students ("Meet Deborah," 2004). Metcalf uses many types of technology, such as Alpha Smart, Imagination Express and portable keyboards. While technology may not be listed as a criterion for most awards, it would certainly indicate proficiency in the area of innovative teaching and learning.

In summary, there has been very little research on the amount of technology resources used by award-nominated or award-winning teachers in the United States. However, the effective integration of technology in classrooms is a proven strategy for enhanced student learning. While it appears that the use of technology resources in P-12 education is on the rise, there are still many obstacles that impede progress, including funding, training and time. Professional development courses hold promise; there is evidence that technology training can have an impact upon the utilization of technology resources in the classroom. However, there are many challenges to these professional development classes, including the motivation and attitudes of the teachers. Additionally, once the teachers feel comfortable enough to begin using technology resources in their classrooms, there is often a lack of support. Troubleshooting technology problems can be frustrating and can quickly lead to the abandonment of technology resources. There are many different criteria that are attributed to outstanding teachers. They appear to be

leaders in their communities, have the respect of their peers, be passionate about their craft and be compassionate with their students. It is worth noting that this study also shows that outstanding teachers tend to look for unique ways of delivering content and are always open for new instructional methods. They strive to connect with their students and conduct a class that keeps their students engaged with the material. Appropriate use of technology resources would be a good fit for these recognized teachers. However, according to the selection criteria of states across the U.S., technology use is not a requirement when considering nominees for outstanding teacher awards. This enigma will be addressed by exploring the use of technology resources by teachers that have been recognized for their excellence in the classroom.

CHAPTER III

METHODOLOGY

Introduction

As mentioned in chapter I, the main purpose of this study will be to determine if any relationship exists between award-nominated teachers and the application of technology in their classroom. The two main research questions that the survey aims to ascertain are:

1. What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on:
    a. Years of teaching
    b. Grade taught
    c. Usage during instruction
    d. Students' use of technology resources
    e. Professional development
    f. Beliefs about technology resources in education
    g. Experience with technology over the past several years
2. To what extent do a sample of P-12 teachers who have been nominated for the Tennessee Teacher of the Year Award and a sample of P-12 teachers who have not been nominated for the Tennessee Teacher of the Year Award differ in the use technology resources in (a) their teaching and (b) their professional development?

Sample

For the purpose of this study, the sample was composed of two groups. The first group was comprised of all the teachers that were nominated in 2003 and 2004 for the Tennessee Teacher of the Year Award. The names of the teachers that were nominated for the award were available on the Tennessee Department of Education website. The nominees came from the nine regions of the State of Tennessee: Memphis/Shelby, Northwest, Southwest, Mid Cumberland, South Central, Upper Cumberland, Southeast, East Tennessee and First Tennessee (Northeast). Each region produced three nominees for the state award in 2004 and two nominees in 2003. In total, questionnaires were sent to the 45 nominees in this group.

The second group was comprised of 45 teachers that practice in the same school or school district as their award-nominated peers, yet have never been nominated for the Tennessee Teacher of the Year award. The list of award-nominated teachers and their respective schools was used to select the participants from the 2nd group. Care was taken by the researcher to select teachers that teach very similar subject matter in order to limit bias in the form of subject areas that lend themselves more easily to technology integration. Participants were selected from the same subject area, grade and school as the ones who were award-nominated. If a similar teacher could not be located in the same grade as the award-nominated teacher, then one was selected from a grade above or below the award-nominated teacher. When more than one teacher was available to be selected, a number was assigned to each available teacher and then a random number

generator was used to make the selection. None of the participants in the survey were aware of the criteria that were used to make the selections.

Setting

The schools in this study are located across the state of Tennessee in nine different regions. They encompass a broad range of educational settings, including inner city, suburban and rural schools. The study includes elementary, middle and high schools. Due to the selection process by the Tennessee Department of Education, the elementary, middle and high school teachers have ample representation among the nominees.

Design of Questionnaire

The purpose of the questionnaire was to gain an understanding of the level of technology resource application in the teacher's classroom. A nationally validated survey that has previously been tested was adapted for this study. The survey, known as Teaching, Learning and Computing: 1998, was co-developed by researchers at the Center for Research on Information Technology and Organizations and the University of California, Irvine. The results of the survey included a 75% response rate in the initial state and a 70% response rate at the individual state, with a total of 4,100 teachers completing the questionnaires.

The Teaching, Learning and Computing (TLC) questionnaire is 27 pages in length and addresses some areas that were not needed for this study. As a result, questions were selected from the TLC survey to use in this study. Some of these questions were further modified to address the needs of this study. The modifications were made due to the

passage of time as well as research that has been done since the original study. Additionally, several of the modifications were made to modernize the study, mainly by the inclusion of new educational technologies that have been developed over the past seven years. To further address the research goals, the researcher added research questions of his own. The researcher's additions included questions 1, 2, 3 and 11. The instrument can be found in Appendix A.

Data Collection Procedures

Phase I – Process

1. The 45 TTOY nominees from 2003 and 2004 were entered into a Microsoft Excel spreadsheet, along with their grade level, subject area, school, school district and mailing address for their school.
2. The second group of participants, the teachers who have not been nominated for the TTOY award, were also entered into the Excel spreadsheet. Their names corresponded to the nominee from their school.
3. After selecting each group of participants for the survey, a package was assembled and mailed to each participant. A mail merge was created using Microsoft Word and Microsoft Excel to create address labels as well as a personalized instruction sheet. Each survey packet included (1) an instruction sheet with informed consent statement, (2) the questionnaire, (3) a self-addressed stamped envelope for the return of the completed questionnaire and informed consent statement and (4) a URL where the participants could later go to see the

results of the study. Participants were given two weeks to complete the survey and return it.

4. The surveys were mailed on April 6, 2005 and were due back by April 22, 2005.
5. As an incentive to fill out and return the questionnaire, the participants were informed that each returned questionnaire would be assigned a random number. A random number generator was then used to select a number, and the corresponding participant received a gift certificate to Amazon.com.
6. On April 22, 2005, a reminder was sent out to all participants who had failed to return their questionnaires.
7. As surveys were returned, a Microsoft Excel spreadsheet was used to track the responses. When a participant returned a survey, a "complete" box was filled out next to the participant's name. This aided in identifying anyone who had not yet returned his or her survey, as well as the subsequent mail merge that was done to generate reminders to participants who had not responded.

Phase II – Data Analyses

After all of the surveys were received, the completed Excel spreadsheet was imported into SPSS for analysis. All tests were conducted at the .05 level of significance. There are two questions that the survey addresses:

1. What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on:

a. Years of teaching
b. Grade taught
c. Usage during instruction
d. Students' use of technology resources
e. Professional development
f. Beliefs about technology resources in education
g. Experience with technology over the past several years

2. To what extent do a sample of P-12 teachers who have been nominated for the Tennessee Teacher of the Year Award and a sample of P-12 teachers who have not been nominated for the Tennessee Teacher of the Year Award differ in the use technology resources in (a) their teaching and (b) their professional development?

Table 1 below illustrates how each survey question focuses on each research question. The survey can be found in Appendix A.

Table 1

Relationship Between Research Questions and Survey Questions

Specific research question	Survey question that applies
2	3,4,5,6,7,8,9,10,11,12,13,14,15
1a	1
1b	2
1c	3,4,7
1d	3,9,10
1e	4,6
1f	5,11,14,15
1g	8,12,13

CHAPTER IV

FINDINGS

The purpose of this study was to examine the use of technology resources by two distinct groups of teachers across the state of Tennessee. The first group was comprised of teachers who have been nominated for the Tennessee Teacher of the Year Award and the second group contained teachers who had never been nominated for the award. This study examines various dimensions of technology use, including: experience, grade level, teacher preparation and classroom instruction. There were a total of 48 participants who responded to the survey from a total of 82 surveys mailed out, generating an overall response rate of 59%. Of these 48 participants, 28 were award-nominated teachers and 20 were non award-nominated teachers. It should be noted that some respondents did not answer every survey question, which explains the variation in the number of responses for each question.

Results of Data Analysis in Response to the Research Questions

Research Question 1a: What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on years of teaching?

Question 1 on the survey was used to gather demographical data on the experience level of the participants. Question 1 asked "How many years have you been

teaching P-12?" The participants were given a blank to fill in the number of years they had been teaching P-12.

Of the participants who responded, the average length of teaching experience was 21 years. Table 2 presents the summary responses from the two groups of participants. The average teaching experience among the award-nominated teachers is 28 years. The non award-nominated teachers had an average of 18 years of teaching experience. A t-test was used to analyze the data and there is no significant difference in years of experience between the two groups. Therefore, no conclusion can be made about the differences in technology resource use between the two groups of participants, based on their years of experience.

Table 2

Years of Teaching Experience

	Award-Nominated Teachers	**Non Award-Nominated Teachers**
Number of Responses	28	18
Mean	22.9	18.3
Standard Deviation	8.3	11.1
t = 1.603 **df** = 44		

Research Question 1b: What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on the grade being taught?

Question 2 on the survey was used to gather demographical data on the grade level being taught by each of the participants. Question 2 asked, "What grade do you currently teach?" Although the Tennessee Teacher of the Year program accepts nominees from three groups of teachers (K-6, 7-8, 9-12), the response rate from the 7th and 8th grade teachers was very low. Because of this, the 7-8 grade responses were merged with those from 9-12 grade. After merging the groups, the overall dispersal of grades among the award-nominated and non award-nominated teachers was very similar. Of the award-nominated teachers, 61% taught grades K-6 and 39% taught grades 7-12. Among the non award-nominated teachers, 58% of the participants taught grades K-6 while 42% taught grades 7-12. A Pearson Chi-Square test was used to analyze the data and there is no significance in the grade distribution between the two groups. Therefore, no conclusion can be made about the differences in technology resource use between the two groups of participants, based on the grade level taught. The results of the analysis can be seen in Table 3.

Table 3

Grades Taught by Participants

	Award-Nominated Teachers	**Non Award-Nominated Teachers**
K-6	17 *(61%)*	11 *(55%)*
7-12	11 *(39%)*	9 *(45%)*
$\chi^2 = .157$ **df** = 1		

Research Question 1c: What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on usage during instruction?

Questions 4 and 7 on the survey were used to answer this research question. Question 4 stated to the participant "Please check the one description of your use of technology resources that most clearly applies to you." There were four responses from which the participant chose:

1. Never used technology resources.
2. Don't currently use technology resources but have done so in the past
3. Use only to prepare for class
4. Use with students as well as during class preparation

No participants selected responses 1 or 2 on the survey. These responses were therefore disregarded during the analysis. The number of participants who selected response #3

was very low, so they were disregarded as well. The data analysis shows that just under 97% of the award-nominated teachers indicated that they use technology with their students as well as during preparation whereas 90% of the non award-nominated teachers indicated the same.

Survey question 7 asked, "How frequently do you use technology resources while teaching your classes? The participants were given a list of technology resources and asked to rate how often they utilized each resource. A 4 point Likert scale was used for the responses. The highest value, "4" denoted More Than Weekly, "3" denoted Weekly, "2" denoted "Occasionally" and "1" denoted Do Not Use. Table A1 in Appendix B shows the overall total use of each technology resource by the combined groups.

As indicated in Table 4, the frequency of teacher technology resource use among the award-nominated teachers is a mean of 2.44, while the non award-nominated teachers have an overall mean of 1.90. The difference between the two groups is significant (.004).

Research Question 1d: What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on students' use of technology resources?

Questions 3, 9 and 10 on the survey were used to answer this research question. Question 3 asked, "How important is it to you for your students to learn about technology resources and their applications?" The participants were asked to check the response that

Table 4

Frequency of Teacher Technology Resource Use While Teaching

	Award-Nominated Teachers	**Non Award-Nominated Teachers**
Number of Responses	28	20
Mean	2.44	1.90
Standard Deviation	.66	.50
t = 3.075* **df** = 46 *significant at .05 level		

most closely resembled their belief. Participants responded to this question using a 5-point Likert scale. The choices ranged from (5) Very Important to (1) Unimportant.

The mean response of each group is shown in table 5. A higher mean indicates that the teachers were more likely to have their students learn about technology resources and their applications. The award-nominated teachers had an overall mean of 4.36 while the non award-nominated teachers had a mean of 4.25. These means fall between the responses "Somewhat Important" and "Very Important." There is no significant difference (.664) between the groups.

Question 9 asked, "Where do students use computers during your classes, and how many computers are available in each location?" Participants were asked to indicate where the students use computers and how many computers are available to them. Table 6 shows the breakdown of computer usage by location. There was no significant difference between the two groups or participants in any of the locations.

Table 5

Importance of Student Technology Use According to Teachers

	Award-Nominated Teachers	**Non Award-Nominated Teachers**
Number of Responses	28	20
Mean	4.36	4.25
Standard Deviation	.83	.85
t = .438 **df** = 46		

Table 6

Number of Computers Available in Each Location

	Award-Nominated Teachers	**Non Award-Nominated Teachers**
In the Classroom		
Number of Responses	28	20
Mean	2.79	4.30
Standard Deviation	2.90	6.35
t = -1.113 **df** = 46		
In the Computer Lab		
Number of Responses	28	19
Mean	15.32	12.21
Standard Deviation	12.01	12.59
t = .855 **df** = 45		
In the Library or Media Center		
Number of Responses	28	19
Mean	3.89	4.26
Standard Deviation	6.67	7.33
t = -.179 **df** = 45		

Question 10 on the survey asked "For each of the following types of software, please indicate how many lessons your students have used that type of software this school year in your classes." Participants were presented a list of 15 types of software, and they were asked to rank the frequency of software use by checking one of four different selections on a Likert Scale. The selections ranged from "no lessons" to "more than 10 lessons." Table 7 shows the mean selection (1 being the least frequent and 4 being the most frequent) from each group of participants for all 15 categories. Word processing, games and a web browser are the most commonly used software packages among the award-nominated teachers as well as the non award-nominated teachers. Interestingly, there is no measurable difference between the means of the two groups, although there is a general trend towards the award-nominated teachers using software more frequently.

Research Question 1e: What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based professional development?

Question 6 on the survey was used to answer this research question. Question 6 stated, "How frequently do you use technology resources in preparing for teaching your classes or other related professional activities?" Participants were asked about several different ways of using technology resources and could rate them from (1) "Do Not Use" to (4) "More Than Weekly." Table 8 shows the mean responses from the two groups of teachers for each area of preparation. Both groups of participants indicated that they use

Table 7

How Many Lessons Teachers Have Students Use Software During School Year

	Award-Nominated Teachers		**Non Award-Nominated Teachers**	
	Mean	Standard Deviation	Mean	Standard Deviation
Games	2.72	1.34	2.24	1.10
Simulations	1.96	1.10	1.88	1.17
Reference CD-Rom	2.20	1.04	1.88	1.05
Word Processing	2.80	1.29	2.47	1.23
Presentation	2.32	1.28	2.06	1.20
Publishing	1.76	1.13	1.88	1.05
Imaging	1.64	1.04	1.53	1.07
Spreadsheet	1.64	.95	1.53	1.00
Database	1.44	.65	1.53	1.07
Multimedia Authoring	2.00	1.25	1.94	1.14
Video Editing	1.32	.75	1.12	.33
Web Browser	2.84	1.28	2.65	1.14
Email	1.68	.75	1.29	.33
Concept Mapping	1.36	1.28	1.29	1.14
Web Authoring	1.40	1.11	1.41	1.00

Table 8

How Frequently Teachers Use Technology Resources When Preparing for their Classes

	Award-Nominated Teachers		**Non Award-Nominated Teachers**	
	Mean	Standard Deviation	Mean	Standard Deviation
Grades	2.69	1.23	2.35	1.27
Handouts	3.35	.94	2.82	1.07
Correspond with Parents	2.54	.76	2.65	1.05
Write Lessons	2.89	.99	2.59	1.06
Get Information from Internet	2.92	.85	2.41	1.12
Digital Imaging	2.54	1.02	1.94	.90
Exchange Files	2.27	.92	1.88	.78
Post Student Work	1.39	.85	1.41	.87

technology resources frequently when preparing for their classes. Especially noteworthy is the how frequently the participants use technology to create handouts as well as getting information from the Internet. While there is no significant difference between the two groups of participants, there is a general trend towards the award-nominated teachers using technology more frequently for class preparation.

Research Question 1f: What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on their beliefs about technology resources in education?

Survey questions 5, 11, 14 and 15 were used to answer this research question. Question 5 asked, "Which of the following are among the objectives you have for student technology resource use?" Participants were asked about several different ways of using technology resources and could select each objective that they had for their students. Table 9 shows teachers' objectives for student technology use, as well as the total number of participants that selected each objective. A side-by-side comparison of the two groups of participants reveals very little difference between their objectives for student technology use. Both groups of participants felt it was very important for students to master skills and remediate those that were not learned well. Neither group of participants emphasized electronic communication or information analysis. It should be noted that the data indicates a general trend for the award-nominated teachers to impress upon their students the need to improve their computer skills.

Table 9

Teachers' Objectives for Student Technology Use

Objective	Award Nominated	Non Award Nominated
Mastering skills just taught	21 *(75%)*	14 *(70%)*
Remediation of skills not learned well	23 *(82%)*	16 *(80%)*
Expressing themselves in writing	17 *(60.7%)*	10 *(50%)*
Communicating electronically with other people	8 *(28.6%)*	6 *(30%)*
Finding out about ideas and information	20 *(71.4%)*	16 *(80%)*
Analyzing information	11 *(39.3%)*	7 *(35%)*
Presenting information to an audience	13 *(46.4%)*	9 *(45%)*
Improving computer skills	20 *(71.4%)*	11 *(55%)*
Learning to work collaboratively	16 *(57.1%)*	10 *(50%)*
Learning to work independently	20 *(71.4%)*	13 *(65%)*

Question 11 asked "Which of the following statements most closely represents your beliefs about technology resource use in classroom instruction and student learning?" The participants were given four choices to select from and were only allowed to make one selection. The choices ranged from a Likert Scale of (1) "I believe technology resources hold no potential for effective classroom instruction and student learning" to (4)"I believe technology resources hold a great deal of potential for effective classroom and student learning." The resulting data can be seen in Table 10. A 2-tailed t-test was used to test the difference between the two means. The test reveals that there is no significant difference (.307) between the two groups of participants.

Table 10

Teacher Beliefs about Technology Resource Use for Student Learning

	Award-Nominated Teachers	**Non Award-Nominated Teachers**
Number of Responses	28	20
Mean	3.79	3.65
Standard Deviation	.42	.49
t = 1.03 **df** = 46		

Question 14 asked "Which of these statements accurately describes your desire to use technology resources in your future classes?" The participants were given four choices to select from, in a Likert Scale range of (1) "I have no desire to use technology resources in my class" to (4) "I already use technology resources and would like to use them even more during my classes." A 2-tailed t-test was used to test the difference between the two means. The results of the test can be found in table 11. There was no significant difference between the two groups of participants.

Question 15 asked "Which of these are advantages of using technology resources in teaching?" This question was broken down into five subparts where participants were asked to rate the advantages of each. The ratings were broken into a Likert Scale of (1) "Not True, Not an Advantage" to (4) "True, a Strong Advantage." The mean responses of the participants can be found in Table 12. A 2-tailed t-test was used to analyze the data

Table 11

Teachers' Desire to use Technology Resources in Future Classes

	Award-Nominated Teachers	Non Award-Nominated Teachers
Number of Responses	28	20
Mean	3.54	3.60
Standard Deviation	.88	.68
t = -.27 **df** = 46		

Table 12

Teachers' Beliefs About the Advantage of Using Technology Resources in Teaching

	Award-Nominated Teachers		Non Award-Nominated Teachers			
	Mean	**SD**	**Mean**	**SD**	**t**	**df**
Students create better looking products	3.74	.54	3.68	.67	.29	40
Technology provides a welcome break	3.57	.63	3.55	.83	.10	46
Students help one another more	3.20	.91	3.17	.79	.13	41
Students take more initiative	3.30	.88	3.27	.59	.15	36
Students work harder at their assignments	3.16	.99	3.29	.85	-.46	40

and there was no significant difference found between the two groups of participants in any of the advantage categories.

Research Question 1g: What are the differences between the technology resource use of teachers who have been nominated for the Tennessee Teacher of the Year Award and their peers who have never been nominated based on their experience with technology resources over the past several years?

Questions 8, 12, and 13 were used to answer this research question. Question 8 asked, "In what setting did you first become reasonably comfortable with using technology resources?" Participants were given six possible answers to choose from, ranging from "high school or earlier" to "more recently during my career." Some of the choices had very few responses, so the choices were merged into two categories: "Prior to teaching" and "During teaching career." The responses and results of the Pearson Chi-Square test can be seen in table 13 below. There was a significant difference (.045) between the two groups of participants.

Question 12 asked "How important were technology resources in your teaching in each of the past 3 academic years?" Participants were given a Likert Scale to rate the importance of technology resource use in each of the past three academic years. The scale ranged from (1) Did Not Use to (4) Very Important. Table 14 shows the mean response of each group of participants for the three selected academic years. A t-test was run on the data and there was no significant difference between the two groups of participants in any of the years.

Table 13

Where Did Teachers Become Reasonably Comfortable Using Technology

Period of Time	Award-Nominated Teachers	Non Award-Nominated Teachers
Prior to teaching	4 *(15.4%)*	8 *(42.1%)*
During teaching career	22 *(84.6%)*	11 *(57.9%)*
$\chi^2 = 4.001$* **df** = 1 *significant at .05 level		

Table 14

Importance of Teacher Technology Resource Use Over the Past 3 Academic Years

	Award-Nominated Teachers	**Non Award-Nominated Teachers**
2004-2005		
Mean	3.54	3.30
Standard Deviation	.15	.18
t = .1.01 **df** = 46		
2003-2004		
Mean	3.43	3.25
Standard Deviation	.16	.19
t = .72 **df** = 46		
2002-2003		
Mean	3.21	3.15
Standard Deviation	.18	.21
t = .24 **df** = 46		

Question 13 asked "Compared to three years ago, are you using technology resources more frequently or less frequently in these ways." The participants were given five categories to rate the frequency of their technology use. The frequency ratings were presented in a Likert Scale, ranging from (1) Do Not Use to (5) Much More Frequently. Table 15 presents the overall means of each group for each of the five categories. The means between the two groups of participants are very similar, although when compared to three years ago there is a trend for the award-nominated teachers to be more willing to try out new resources as well as use resources for non-work activities, when compared to the non award-nominated teachers.

Table 15

Frequency of Technology Resource Use Compared to Three Years Ago

	Award-Nominated Teachers		**Non Award-Nominated Teachers**	
	Mean	Standard Deviation	Mean	Standard Deviation
Trying out new resources	4.14	.15	3.60	.18
Using resources for class preparation	3.93	.16	3.70	.19
Using resources for non-work activities	4.03	.19	3.65	.22
Assigning students to use resources	3.46	.19	3.45	.22
Suggesting that students use resources in their projects	3.43	.19	3.65	.22

Research question two asked **"**To what extent do a sample of P-12 teachers who have been nominated for the Tennessee Teacher of the Year Award and a sample of P-12 teachers who have not been nominated for the Tennessee Teacher of the Year Award differ in the use technology resources in (a) their teaching and (b) their professional development?" This question looks at the overall differences between the groups of participants, whereas the first research question, and its corresponding parts, was used to look at very specific differences between the two groups. After analyzing each of the 15 survey questions, there are some areas where the two groups differ.

In regards to their teaching, both award-nominated and non award-nominated teachers have strong beliefs about the potential of technology resources in the classroom. Both groups also use technology resources with their classes. However, the one significant difference between the two groups is how frequently these technology resources are used. Award-nominated teachers indicated that they use technology resources more frequently with their classes than their non award-nominated counterparts.

In regards to professional development, both groups of participants indicated that they use technology quite frequently for completing tasks outside of teaching. An interesting difference between the two groups is when the teachers first became comfortable with using technology. The award-nominated teachers were more likely to have become comfortable with technology resources more recently during their teaching career while the non award-nominated teachers were more mixed, with some having become comfortable with technology earlier during their careers and others becoming comfortable more recently.

Discussion

The researcher acknowledges that the sample size of this study was small. Out of a total of 82 surveys that were mailed out, the participants returned 42. The participants were selected based on the fact that they were either a) nominated for the Tennessee Teacher of the Year Award within the past two years or b) chosen as a counterpart to the award-nominated teacher at their school. The return rate of the award-nominated teachers (65%) was higher than that of the non award-nominated group (52%) for no explainable reason. Perhaps the award-nominated teachers are more likely to be organized and task-oriented, thus more likely to take the time to fill out and return a survey before it is due. A reminder was also sent out to all participants who had not returned their surveys to give them additional time to return the survey. This reminder generated a few more responses, however, a deadline had to be enforced to allow the researcher to begin analyzing the data. The timing of the survey might have impacted the return rate as well. April is generally a busy month for educators in the state of Tennessee due to state examinations and the school year's end.

Discussion on Award-Nominated Teachers and Non Award-Nominated Teachers

Looking at the overall response rate from the award-nominated teachers, as well as their selections on the surveys, it is evident that these teachers are very serious about their profession and spend a great deal of time with technology during their classes as well as during professional development. The survey response rate from this group of participants was high, and most of the participants returned the survey well before the

deadline. This reinforces the criteria that was originally used for their selection: exceptionally involved and dedicated educators.

The award-nominated participants were prolific users of technology resources, placing great emphasis on its usage with the students as well as for other tasks related to their jobs. Over 96% of the award-nominated teachers indicated that they use technology with their students as well as for preparing for their classes. The teachers also placed heavy importance on student technology use, with the overall mean falling close to the "very important" selection on the survey. While many teachers solely use technology resources when they have to, the award-nominated teachers use it for various responsibilities, including research, correspondence and creation of lessons and handouts. This points to an understanding of technology resources tools and the potential that they have for the educational discipline.

Two interesting areas where award-nominated teachers stood apart from their non award-winning counterparts were the frequency of technology resource usage and where and when they learned how to use technology resources. The participants were given a table of various technology resources from which they could rate the frequency of usage. The overall usage of these resources as a whole was greater among the award-nominated teachers. This is an important point, because while both groups of participants indicated that they use technology with their classes, and both groups believe that technology offers great potential for student learning, the award-nominated teachers indicated that they use technology resources more frequently than their peers who have never been nominated. Some of the most commonly used technology resources included: the computer, the Internet, instructional software and making presentations.

It is also interesting to note that award-nominated teachers indicated that they have acquired their technology skills more recently than their non award-nominated counterparts. While it might be logical to think that teachers who have been using technology for a greater length of time would be more likely to use it frequently within their classrooms, the inverse was true with this study. The majority of award-nominated participants signified that they learned how to use technology resources more recently during their teaching careers, while the non award-nominated teachers were almost evenly split, with half having learned about technology resources before they began teaching and the other half having learned about technology resources more recently during their professional careers. This difference between the groups could be attributed to the award-nominated teachers having a desire to learn about new methods of learning and instruction. This could also be a positive indicator that professional development programs are attaining their goals of training teachers on the use of technology resources, who then make good use of their new skills.

Discussion on Technology Resources

If nothing else, this study is evidence that technology resources are being used by a large majority of teachers in their classrooms, regardless if their peers and the Tennessee Department of Education consider them "outstanding." Almost every participant indicated that he/she used technology in some capacity, either in the classroom or to prepare for class. Over 90% of all participants signified that they use technology resources both with their students as well as during preparation for their

classes. Almost all of the participants also placed great emphasis on the importance of student technology use.

The availability of computers did not seem to be a vital issue among the participants; the majority had between 12 and 15 computers available to their students in a computer lab. Classroom computer availability has room for improvement, with an average of two to four computers available in each classroom. Although there is a great deal of discussion about library and media centers among educators, this study reveals that currently there is only an average of three to four computers in the media centers. It should be noted that this study did not assess the usefulness of the computers, only their availability. Some of the computers could easily be several years old and have out-of-date hardware and software, or perhaps not work at all.

After looking over the results of the surveys as well as the research that was examined prior to the study, the researcher sees potential and challenges for technology resource integration into P-12 classrooms across the state of Tennessee. It is encouraging to see the overall implementation of resources among teachers, with the majority indicating that they use technology resources with their students and for preparation. While some teachers do not use these resources as frequently as others, it is a decisive step towards integration of technology in the classroom. Almost all of the participants in this study would be considered "seasoned" teachers; the average teaching experience among the award-nominated and non award-nominated teachers is 23 and 18 years, respectively. This could be an important indicator of the usefulness of professional development programs. These teachers have been in the classroom for several decades and might have missed out on the technology integration classes that are now being

offered in college-level teacher education programs. In order to bridge this gap between new teachers and veteran teachers, most schools offer professional development opportunities that include technology training. A majority of the award-nominated teachers signified that they have become comfortable with technology more recently during their teaching careers, a sign that professional development programs are working.

Another interesting area to examine is the way that technology resources are being used outside of the classroom. The survey participants indicated that they use technology resources for a variety of preparation tasks, including: grading, handouts, correspondence with parents, lesson planning, Internet research and digital imaging. As noted above, many of these educators did not receive technology training during their university studies. It is encouraging to see seasoned teachers using technology resources for multiple tasks.

The overall belief about the potential of technology resources was very positive, with both groups of participants indicating that technology resources hold a great deal of potential for student learning. Their beliefs are illustrated in the objectives that they have for student learning with technology resources. Both groups of participants feel that technology resources will help their students master skills, remediate skills, express themselves through writing, research new ideas and information, improve computer skills and learn to work independently.

Summary

This chapter presented the results of the data analysis and answers to the study's two research questions. The findings were presented both in tables and in narrative formats. The results of the descriptive statistics answered Research Questions 1a and 1b. Both groups of participants indicated that they were using a great deal of technology in the classroom as well as during their professional development. There were very few differences between the two groups of participants in the areas of: years experience, grade level, usage during instruction, student usage, professional development, beliefs about technology resource use in education, and overall experience.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter is organized into 4 sections. The first section details the overall purpose and research procedures of this study. The second section presents the conclusions that are drawn from the findings in Chapter IV. The third section of this study presents implications, and the last section suggests recommendations for future studies.

Summary

This study sought to explore the technology resource use of award-nominated and non award-nominated teachers in the state of Tennessee. The study examined their overall experience with technology resources, their beliefs about technology resources, their use of technology resources with students and use for other professional activities. The study wanted to examine the two groups of participants (award-nominated teachers and non award-nominated teachers) and see if there were any differences in the use of technology resources.

In order to gather the information regarding technology resource use, the researcher selected an existing instrument that was used by a Teaching, Learning and Computing (TLC) study. The original instrument was 27 pages in length and addressed areas that were not applicable to this study, so the researcher adopted the instrument to meet the requirements for the research. Questions 1, 2, 3, and 11 were added to the existing instrument by the researcher. The remaining questions were modified to reflect

the term "technology resources," due to the fact that the original study intended to only measure the computer use of teachers.

The questionnaire, which attempted to assess the amount of technology resource use by award-nominated and non award-nominated teachers, was modified to specifically address key areas of technology resource use in P-12 classrooms. The survey was mailed to 82 teachers across the state of Tennessee. Fourty-one of these participants were award-nominated teachers and 41 of the participants have never been nominated for the Tennessee Teacher of the Year award. A total of 48 surveys were returned, yielding a response rate of 59%. The participants came from across the state of Tennessee, representing rural, suburban and urban schools. The participants were primarily from grades K-6 and 9-12, there were only a few responses from the middle grades (7-8).

The computerized process of data analysis was conducted by using the Statistical Package for Research Software Program (SPSS) version 12.0. The data was organized into a Microsoft Excel Spreadsheet as the surveys were received. The Excel file was later imported into SPSS for analysis. Chi-square and T-tests were used to analyze the data.

Conclusions

An examination of the data from this study shows that there are very few differences between the two groups of participants. When looking at usage during instruction, it is evident that there is no statistical difference between the two groups of participants. Almost all of the participants in each group indicated that they use technology resources for preparing for class as well as with their students. While past research (Brand, 1998; Duffy, 2002; McEwan, 2002) indicates that award-winning

teachers embrace new methods of delivering content to their students, the non award-winning teachers in this study appear to be just as willing to utilize technology. Interestingly, the award-winning teachers in this study do use technology resources more frequently than their non award-winning counterparts. When asked how often they used technology resources while teaching their classes, the award-nominated teachers had a significantly higher overall group average than their non award-nominated peers. This illustrates an interesting contrast between the two groups; while both groups are likely to use technology resources with their students and during preparation, the award-nominated teachers use the technology resources with greater recurrence. This is certainly an area that could use further exploration. What are the reasons why award-nominated teachers would use technology more frequently than their peers? Does it have to do with their style of teaching, or do they recognize the potential for greater learning through technology resource infusion?

An examination of student technology usage also shows similar beliefs among the surveyed educators. The data analysis indicates that both groups of teachers overwhelmingly believe that student technology use is very important. The teachers were able to select different objectives that they want their students to achieve when using technology resources. There was no difference between the two groups of participants, both the award-nominated and non award-nominated teachers want their students to master skills that were just taught, remediate skills that were not learned well, find out about ideas and information, improve computer skills and learn to work independently. Some objectives were not selected very frequently among either group or participants, including communicating electronically with other people and analyzing information.

The breakdown of computer availability also showed no difference, signifying that there are an equal amount of computers available to the students, regardless of whether or not the teacher has been nominated for an outstanding teaching award. The responses indicate that there is no lack of technology resource access among either group of participants.

Professional development was another key area that was investigated. The two groups of participants were surveyed about various ways they use technology resources outside of instruction. Both groups indicated that they use technology resources for a variety of activities, including: figuring grades, creating handouts, corresponding with parents, writing lesson plans, getting information from the Internet, and using digital imaging. There was no difference between the two groups of participants, indicating that technology resources are used by many different teachers for tasks other than instruction.

Beliefs about the potential of technology can have a significant impact on the success of technology implementation. When asked about the advantages that technology resources offer while teaching, both groups of participants indicated that all of the selections offered a relatively strong advantage. Both groups believe that technology resources help students create better looking products, provide a welcome break, allow students to help one another more often, help students take more initiative, and help students work harder at their assignments.

Finally, both groups of participants were surveyed about their technology experience over the past several years. When the teachers were asked about where they first became reasonably comfortable using technology, a large majority of the award-nominated teachers indicated that it was more recently during their teaching career.

Conversely, the non award-nominated teachers were more closely split, with some becoming familiar with technology prior to their teaching career while others becoming familiar with technology during their teaching career. This difference was significant and perhaps points to the effectiveness of professional development courses as well as the teaching philosophy of award-nominated teachers, who are looking for innovative ways to deliver instruction.

When the participants were asked about how important technology resource use has been to them over the past three academic years, both groups of participants indicated very strongly that technology resource use has been important. There was no significant difference between the two groups. The participants were also asked about how specific technology resources have been used over the past three years and if there has been any change over that period. Both groups of participants indicated that they have been more likely to try out new resources, use resources for class preparation and use resources for non-work activities. Both groups also showed a moderate increase in assigning students to use resources as well as suggesting that students use resources in their projects. There was no significant difference between the two groups of participants.

Implications

There have been few, if any, recent studies that look at technology resource use among award-nominated and non award-nominated teachers. The researcher recognizes that technology resources present a challenge to teachers, administrators and budgets, especially with the required time and money that is needed to capitalize on the potential of technology in the classroom. Though the sample of 42 teachers was relatively small,

there was enough data to reveal that technology resources have been embraced by teachers, regardless of whether or not they have been recognized as "outstanding." Though there is still some resistance to technology resources among some teachers in P-12 education, it appears that the majority of educators see real potential in its classroom implementation.

A major implication of this study is that while both award-nominated and non award-nominated teachers use technology resources with their students as well as for class preparation, award-nominated teachers use the technology more frequently. This could be an indication that award-nominated teachers, already recognized as outstanding educators, see technology resources as a novel and effective way to deliver content and enhance student learning and want to use it frequently. It will be interesting to see if this trend continues in coming years.

Another implication concerns those who are concerned about the success of professional development programs. The award-nominated teachers, who indicated that they use technology resources quite frequently, were more likely to have become comfortable with these technology resources more recently during their teaching careers. This points to the effectiveness of professional development classes that provide training to teachers on the latest technology resources.

Another implication of this study is that Tennessee teachers perceive several advantages of using technology resources in the classroom. With so many teachers appreciating the advantages of technology resources, there are presumably underlying reasons why resources are not used more frequently with the students. Budgetary concerns, as well as lack of training, are areas that should be explored.

The final implication of this study is that the participants overwhelmingly indicated that they would like to use technology resources in future classes. The fact that they desire to use technology is a key ingredient towards successful technology integration; the other being teacher training. It remains important that professional development programs continue to offer training on technology resources and provide teachers with integration ideas so they can use the tools with their students.

Recommendations for Future Research

The findings of this study suggest the following recommendations for future research. Such research may help educators gain an even greater understanding about the role that technology resources play in the classroom, as well as elucidate which teachers are most likely to successfully adopt technology resources into their classrooms.

1. Replications of this study should be conducted with a larger sample size of Tennessee Teacher of The Year nominees, as well as their counterparts who have never been nominated. The result would further illustrate the similarities and differences between the two groups of teachers and more conclusively distinguish the discrepancies of technology resource usage.
2. Findings of this study appear to indicate that teachers who have been nominated for the Tennessee Teacher of the Year Award use technology resources more frequently than teachers who have never been nominated for an award. More specific studies should be conducted in this area to see if the same applies for teachers in other states who have been nominated for excellent teaching awards.

3. Findings of this study appear to indicate that teachers who have been nominated for the Tennessee Teacher of the Year Award have learned about technology resources more recently during their teaching careers. More specific studies should be conducted to determine if this is true among other recognized outstanding teachers. Researchers that are interested in professional development effectiveness could further examine this area to determine if professional development programs are meeting their goals of technology resource training and longevity in the classroom.
4. As was stated previously in Chapter II, there is a deficiency of research in regards to outstanding teachers and their adoption of technology resources as a means of delivering instruction. This is one area that research can be pursued in several ways.

This study focused on award-nominated teachers in the state of Tennessee and their use of technology resources in their classrooms. Their responses were compared with their peers who have never been nominated for the TTOY award. It is hoped that the findings of this study may engender interest in similar research in other states and regions. The message from this research to educators, administrators and policymakers in Tennessee and other states is that technology resources have become an established medium for instruction in the P-12 classroom, and their usage should be further investigated as technology continues to become adopted in classrooms across the United States and abroad.

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APPENDICES

APPENDIX A

Informed Consent Statement

Dear Participant:

My name is Chris Greer and I am pursuing a Ph.D degree in Education with a concentration in Instructional Technology at The University of Tennessee. As partial requirement for this degree, I am currently conducting research to identify how computers and other technology resources are being used in P-12 classrooms. The information gained may be useful in understanding the effect that technology has had and may have on the P-12 curriculum.

You are one of a select group of teachers invited to participate in this study across the state of Tennessee. As a participant, you are asked to complete the enclosed questionnaire, which will take approximately 15 minutes to complete. Please be assured that no identifiable information will be recorded and that your answers will be held in confidence.

Your participation in this study is very important, however, participation is voluntary. By returning the completed questionnaire, you are consenting to the use of your responses as grouped data for research purposes only. A number is assigned to each survey for *tracking purposes only* and at no time will your name be used in the results. The surveys will be stored securely in Claxton 442 for 2 years and then destroyed. Please return the **completed questionnaire** in the self-addressed stamped envelope by April 22, 2005.

Upon receipt of your questionnaire, you will automatically be entered in a drawing for a gift certificate at Amazon.com.

Thank you very much for your consideration and participation.

Chris Greer
Doctoral Candidate

Please note: The results of this survey will be posted at http://web.utk.edu/~cgreer2/survey/ when the study is complete.

Questionnaire for Technology Use in Tennessee P-12 Classrooms

Directions: Please fill out the questionnaire below and return it in the self-addressed, stamped envelope provided. For the purposes of this study, **technology resources are defined as**: computers, the Internet, digital cameras, LCD projectors, scanners, electronic whiteboards, handheld PDAs, digital video cameras and computer software.

1. How many years have you been teaching P-12? _____

2. What grade do you currently teach? _____

3. How important is it to you for your students to learn about technology resources and their applications?

   - ☐ Very important
   - ☐ Somewhat important
   - ☐ Important
   - ☐ Not very important
   - ☐ Unimportant

4. Please check the one description of your use of technology resources that most clearly applies to you.

   - ☐ I use technology resources with my students as well as during preparation for my classes.
   - ☐ I use technology resources **only** to prepare for classes or in other professional activities.
   - ☐ I don't currently use technology resources either with my students or for professional activities, but have done so in the past.
   - ☐ I have never used technology resources in teaching or for any professional activities.

5. Which of the following are among the objectives you have for student technology resource use?

	Check all that apply
Mastering skills just taught	☐
Remediation of skills not learned well	☐
Expressing themselves in writing	☐
Communicating electronically with other people	☐
Finding out about ideas and information	☐
Analyzing information	☐
Presenting information to an audience	☐
Improving computer skills	☐
Learning to work collaboratively	☐
Learning to work independently	☐
Other (describe)_____	

6. How frequently do you use technology resources in **preparing** for teaching your classes or other related professional activities?

I use technology resources to:	Do Not Use	Occasionally	Weekly	More Than Weekly
a. Record or calculate student grades	☐	☐	☐	☐
b. Make handouts for students	☐	☐	☐	☐
c. Correspond with parents	☐	☐	☐	☐
d. Write lesson plans or related notes	☐	☐	☐	☐
e. Get information or pictures from the Internet for use in lessons	☐	☐	☐	☐
f. Use camcorders, digital cameras, or scanners to prepare for class	☐	☐	☐	☐
g. Exchange computer files with other teachers	☐	☐	☐	☐
h. Post student work, suggestions for resources, or ideas and opinions on the World Wide Web	☐	☐	☐	☐

7. How frequently do you use technology resources **while teaching** your classes?

	Do Not Use	Occasionally	Weekly	More Than Weekly
a. Electronic whiteboard	☐	☐	☐	☐
b. LCD projector	☐	☐	☐	☐
c. Making presentations	☐	☐	☐	☐
d. Digital imaging (e.g. scanners, digital cameras, video cameras)	☐	☐	☐	☐
e. Internet / Web	☐	☐	☐	☐
f. Instructional software (e.g. MathBlaster)	☐	☐	☐	☐
g. Computer	☐	☐	☐	☐
h. PDA (e.g. Palm Pilot)	☐	☐	☐	☐
i. Other_____	☐	☐	☐	☐

8. In what setting did you first become reasonably comfortable with using technology resources?

☐ While I was a student in high school or earlier.
☐ While I was in college or getting first teaching credential.
☐ While working in another job, outside of teaching.
☐ During my first 3 years in teaching.
☐ More recently during my teaching career.
☐ I am still not "reasonably familiar and comfortable with using technology resources."

9. Where do students use computers during your classes, and how many computers are available in each location?

		# of computers
1. Classroom	☐	_____
2. Computer Lab	☐	_____
3. Library/Media Center	☐	_____
4. Other: please specify	☐	_____
5. Do not use	☐	

10. For each of the following types of software, please indicate how many lessons **your students** have used that type of software **this school year** in your classes.

	No Lessons	1-5 Lessons	6-10 Lessons	More than 10 Lessons
a. Games for practicing skills	☐	☐	☐	☐
b. Simulations or exploratory environments	☐	☐	☐	☐
c. Encyclopedias and other references on CD-ROM or the Web	☐	☐	☐	☐
d. Word Processing	☐	☐	☐	☐
e. Presentation software (e.g. PowerPoint, AppleWorks)	☐	☐	☐	☐
f. Publishing (e.g. Printshop, MS Publisher)	☐	☐	☐	☐
g. Imaging (e.g. Photodeluxe, MS Paint, Photoshop)	☐	☐	☐	☐
h. Spreadsheet programs	☐	☐	☐	☐
i. Database programs	☐	☐	☐	☐
j. Multimedia authoring software (e.g. Kidpix, HyperStudio, PowerPoint)	☐	☐	☐	☐
k. Video editing (e.g. iMovie, Pinnacle)	☐	☐	☐	☐
l. World Wide Web browser (e.g. Internet Explorer)	☐	☐	☐	☐
m. Email (e.g. Outlook, Apple Mail)	☐	☐	☐	☐
n. Mapping software (e.g. Kidspiration, Inspiration)	☐	☐	☐	☐
o. Web Authoring (e.g. GoLive, Dreamweaver, FrontPage, Netscape Composer)	☐	☐	☐	☐

11. Which of the following statements most closely represents your beliefs about technology resource use in classroom instruction and student learning?

- ☐ I believe technology resources hold no potential for effective classroom instruction and student learning.
- ☐ I believe technology resources hold little potential for effective classroom instruction and student learning.
- ☐ I believe technology resources hold some potential for effective classroom instruction and student learning.
- ☐ I believe technology resources hold a great deal of potential for effective classroom and student learning.

12. How important were technology resources in your teaching in each of the past 3 academic years?

	Did Not Use	Minor Importance	Moderately Important	Very Important
2004-2005 (This Year)	☐	☐	☐	☐
2003-2004 (Last Year)	☐	☐	☐	☐
2002-2003	☐	☐	☐	☐

13. Compared to three years ago, are you using technology resources more frequently or less frequently in these ways:

	Do not use	Less Frequently	Stayed the Same	More Frequently	Much More Frequently
a. Trying out new technology resources	☐	☐	☐	☐	☐
b. Using technology resources for class preparation	☐	☐	☐	☐	☐
c. Using technology resources for non-work activities	☐	☐	☐	☐	☐
d. Assigning students to use technology resources	☐	☐	☐	☐	☐
e. Suggesting that students use technology resources in their projects	☐	☐	☐	☐	☐

14. Which of these statements accurately describes your desire to use technology resources in your future classes?

- ❑ I have no desire to use technology resources in my classes.
- ❑ I would like to learn more about technology resources and begin using them in my classes.
- ❑ I already use technology resources and would like to continue using them in the same capacity.
- ❑ I already use technology resources and would like to use them even more during my classes.

15. Which of these are advantages of using technology resources in teaching? If you have not had enough experience with a particular question, you can click the "don't know" box.

	Not True, Not an Advantage	Somewhat True, a Mild Advantage	True, a Modest Advantage	True, a Strong Advantage	Don't Know
a. Students create better-looking products than they could do with just writing and other traditional media.	☐	☐	☐	☐	☐
b. Technology provides a welcome break for students from more routine learning activities.	☐	☐	☐	☐	☐
c. Students help one another more while using technology resources.	☐	☐	☐	☐	☐
d. Students take more initiative outside of class time, doing extra research or polishing their work.	☐	☐	☐	☐	☐
e. Students work harder at their assignments when they use technology resources.	☐	☐	☐	☐	☐

The survey is now complete. Thank you so much for your participation. Please return this survey in the self-addressed, stamped envelope that came with it. You will then be entered into a drawing for an Amazon.com gift certificate.

APPENDIX B

Table A1

Frequency of Technology Resource Use in the Classroom (All Teachers)

	Do not use		Occasionally		Weekly		More than weekly	
	Count	%	Count	%	Count	%	Count	%
Electronic whiteboard	34	73.9	5	10.9	3	6.5%	4	8.7
LCD projector	26	55.3	9	19.1	6	12.8%	6	12.8
Making presentations	10	21.3	14	29.8	9	19.1%	14	29.8
Digital imaging	12	25.0	26	54.2	5	10.4%	5	10.4
Internet	4	8.9	16	35.6	13	28.9%	12	26.7
Instructional software	9	19.1	14	29.8	10	21.3%	14	29.8
Computer	4	8.5	9	19.1	8	17.0%	26	55.3
PDA	39	86.7	2	4.4	4	8.9%	0	.0

VITA

Christopher John Greer was born on April 27th, 1978, in Memphis, Tennessee. He attended Indiana University in Bloomington, earning a Bachelor of Science degree in Biology in 2000. He continued his education at The University of Memphis where, in 2001, he received his Masters of Science in Education with a concentration in Instructional Design and Technology.

Mr. Greer has served throughout the doctoral program as a graduate teaching assistant within the Instructional Technology program at the University of Tennessee, College of Education, Health and Human Sciences.

Mr. Greer is now an assistant professor of Instructional Technology at Georgia College and State University, where he concentrates on technology implementation ideas for P-12 teachers.