Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration

by

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Abstract

Technology touches almost every part of our lives, our communities, our homes. Yet most schools lag far behind when it comes to integrating technology into classroom learning. Many are just beginning to explore the true potential technology offers for teaching and learning. Properly used, technology will help students acquire the skills they need to survive in a complex, highly technological knowledge-based economy.

Integrating technology into classroom instruction means more than teaching basic computer skills and software programs in a separate computer class. Effective technology integration must happen across the curriculum in ways that deepen and enhance the learning process. Effective technology integration is achieved when the use of technology is routine and transparent and when technology supports curricular goals.

This study examined the attitudes of 76, 6th, 7th and 8th grade teachers towards peer tutoring in technology instruction and integration. The attitudes of teachers were measured through the use of a survey. The study determined the factors that contribute to this group of teachers' use of peer tutoring in technology instruction and integration.

The study identified a profile of teachers who are likely to use peer tutoring, a pedagogical strategy, either in direct technology instruction or instruction that involves the use of computers to reinforce learning.

The results of this research have highlighted important data as well as fundamental issues in Peer Tutoring and Technology Integration. Teachers across the various categories responded similarly to most of the survey items. Regardless of their age, gender, teaching experience and grade level taught, they believe that: Peer tutoring is effective in technology instruction and integration; capitalizing on students' technology skills yields both cognitive and affective benefits. This study will be able to generate change in the field of education as it pertains to useful pedagogical strategies to integrate technology in instruction.

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From “The Hill” of Alabama A&M University to “The Plains” of Auburn University, I am grateful to carry the torch for my father and will do so with pride, while still encouraging him also to continue “the race” (dissertation).

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List of Abbreviations

ALSDE	Alabama State Department of Education
ACOT	Apple Classroom of Tomorrow
CAI	Computer Aided Instruction
CDF	Children’s Defense Fund
CITI	Collaborative Institutional Training Initiative
DVD	Digital Video Disc
IMPACT	Indicators for Measuring Progress in Advancing Classroom Technology
IRB	Institutional Review Board
ISTE	International Society for technology in Education
IT	Information Technology
NETS	National Educational Technology Standards
NCLB	No Child Left Behind
OTA	the Office of Technology Assessment
PAL	Peer Assisted Learning
PLATO	Programmed Logic Automatic Technology Applications
SES	Supplemental Educational Services
SIM	Computer Simulation Program
SPSS	Statistical Package for the Social Sciences

STEM	Science, Technology, Engineering and Mathematics
USDE	United States department of Education
USDC	United States department of Commerce
USDLS	United States Department of Labor Statistics
WWW	World Wide Web

Chapter 1 Introduction

Overview

> In this world of rapid change, where information is expanding exponentially and increasing in complexity, learning is a survival skill. Mastering the basics, reading, writing, and arithmetic is as important as ever, but is no longer enough. Today's students need to learn more than previous generations. They need to know how to find and use new information, to make informed decisions about complicated issues, and to collaborate as part of a team. Since the pace of change shows no signs of slowing in the future, students also need to learn how to learn (Lucas, 1997, p. 14).

The purpose of this research was to expound on the work of Dr. Claudette Coyote-Thompson (2007) and others, (Bloom, 1975; Goodlad, 1979; Grabe & Grabe, 2001; Klaus, 1975; Lengel & Lengel, 2006; Rosenbaum, 1973), inspired with a passion to enable students to excel in their educational endeavor. This study examined teachers' attitudes towards peer tutoring in technology instruction and integration in Alabama rural and urban school districts. In focusing on approaches that are concerned with the cognitive processes underlying peer learning, the research reflects common concerns that teachers experience with students' cognitive processes from developmental to information processing. This study sought to determine whether or not there was a significant and direct relationship to peer tutoring and student success in the classroom through technology instruction and integration. In a global world community, students are expected to be responsible digital citizens who practice safe, legal, and responsible use of technology systems and digital media. Students must comprehend the impact of technology on the cultural, social, economic, environmental, and political aspects of society. Positive attitudes toward technology use are essential to support collaboration, learning, and productivity for success in the twenty-first century (Bitter & Pierson, 2005).

Vygotsky (1978) asserts that culture is the prime determinant of individual development. Humans are the only species to have created culture, and every human child develops in the context of a culture. Through culture children learn much of the content of their thinking which translates into their knowledge. The surrounding culture provides a child with the processes or means of their thinking; this is what Vygotsky (1978) calls the tools of intellectual adaptation. Culture teaches children both what to think and how to think. Initially, the person interacting with the child assumes most of the responsibility for guiding the problem solving, but gradually this responsibility transfers to the child which provides the bases for this study.

Federal legislation in the United States currently mandates that technology be integrated into school curricula because of the popular belief that learning is enhanced through the use of technology (U.S. Department of Education, 2008). The challenge for educators is to understand how best to teach with technology while developing the technological expertise of their students (U.S. Department of Education, 2009). The role of public education in America is to prepare one for the responsibilities of effective citizenship. An effective citizen is one who is capable of contributing to the general welfare of this country through social, economic, and political participation. However there are some who may not be able to fulfill this task if the appropriate schooling is not provided.

Students in grades 6th through 8th grade possess a wide range of intellectual abilities, learning styles, talents, and interests. These students are experiencing a transitional period that includes physical, social, emotional, and intellectual changes (Coote–Thompson, 2007). In addition, students are developing skills to function in a technological society.

The technology content standards for grades 6th through 8th are designed to complement all areas of the academic curriculum. In a world where information increases exponentially, students are expected to develop and use critical-thinking and decision-making skills. Digital tools enhance middle school students' emerging abilities to analyze, synthesize, and evaluate information (Alabama Course of Study: Technology Education, 2002). The integration of technology systems expands and optimizes their ability to use information and to communicate and collaborate with diverse individuals. It is critical for students at these grade levels to expand the knowledge and skills necessary for solving both hypothetical and authentic problems (Alabama Course of Study: Technology Education, 2002). Alabama State Department of Education (ALSDE) (2008) adopted a technology initiative which identifies Alabama's goal of technology fluency for every student. This goal necessitates the seamless integration of technology and twenty-first century skills throughout the curricula. The immersion of technology into the curriculum provides an engaging means for students to locate, assemble, and apply relevant information to make connections with essential knowledge. Effectively integrating technology can extend learning beyond the classroom to ensure that all students achieve the technology fluency necessary to succeed in a global society.

Giving every child a sense of belonging, value, and worth enhances their overall quality of life. Classrooms reflect real life with its challenges and distractions so children need to be immersed in the microcosm of the real world. This is the normal world they will be required to live and work in, so their education should take place in classrooms, which reflect that world. Reeves and Herrington (2002) characterized authentic learning environments as demonstrating real world situations. Reeves and Herrington (2002) study suggested that student activities should have relevancy and open-ended questions, requiring them to outline tasks and subtasks. Students will then be required to investigate the task over a period of time, and from different perspectives. Authentic learning activities encourage collaboration and reflection across different subject areas. Teachers are the logical ones to undertake the task of opening doors to new possibilities for their students. Therefore peer interaction is regarded as beneficial for learners' intellectual, social, and emotional development.

Teaching and learning are highly social activities. Interaction with teachers, peers, and other participants is a major influence on the cognitive and affective attainments of learners. Social interaction among participants in learning contexts is seen as the primary source of cognitive and social development (John-Steiner, 1996).

Young people help each other in many ways. Beginning in childhood, as they play together, children learn important lessons such as sharing, communicating, and cooperating. Although peer learning was standard practice in schools as early as the nineteenth century, there was little mention of it in educational literature until the 1960s when several factors made it newly attractive as a practice, particularly in urban areas (Grabe & Grabe, 2001). Desegregation efforts also sought to increase interracial understanding through diverse, structured peer relationships (Allen, 1976). Finally, a growing number of research studies demonstrated the positive outcomes of peer mentoring on student achievement (Coote–Thompson, 2007).

More recently, in-school peer helping relationships have been viewed as a vehicle for diversifying and redefining the role of the classroom instructor, as a response to personnel and resource limitations, and to facilitate learning through the powerful influence of peer relationships (Bloom, 2004). Further, students being tutored benefit from receiving immediate feedback and clarification of information they don't understand. As a result of their efforts to help others, tutors reinforce their own knowledge and skills, which in turn builds their self-confidence and self-esteem. A supportive environment enhances learning, by providing students with the opportunity to take risks, to make mistakes and ultimately learn and understand new concepts (Alabama Course of Study: Technology Education, 2002). Peer tutoring methods hold great promise for accelerating students' attainment of high academic standards and the development of the knowledge and abilities necessary for thriving in a multicultural world (Bloom, 1984). Since the beginning of the twentieth century, technology has added a new dimension to classroom instruction. Technology use allows many more students to be actively thinking about information, making choices, and executing skills than is typical in teacher-led lessons (Eamon, 2004). Moreover, when technology is used as a tool to support students in performing authentic tasks, the students are in the position of defining their goals, making design decisions, and evaluating their progress (Eamon, 2004). This chapter includes the statement of the problem, purpose of the study, research questions, limitations, assumptions, definitions and organization of the study.

Statement of the Problem

Numerous studies document the importance of educating students in their academic setting (Allen, 1976; Bloom, 1984; Coote–Thompson, 2007; Eamon, 2004; Grabe & Grabe, 2001; Glennan & Melmed, 1995; Lengel & Lengel, 2006). Helping students anticipate and understand the transitioning process can help schools realize a significantly higher student retention rate. The concept behind the tutoring component is to create a friendly environment where the student can feel free to express their feelings and concerns. The use of peer tutors will help to make teachers flexible and enable them to better target their efforts toward individual students (Coote–Thompson, 2007). Likewise, various models of peer tutoring in instruction have been used in education for centuries (Coote-Thompson, 2007).

Some research studies (Herson, Lloyd, Stamer & Sosabowski, 2003; Sugar, W., Crawley, F. & Fine, B., 2004) have been conducted to investigate the attitudes of teachers towards technology in instruction. Studies have also investigated the effect of peer tutoring on improving students' reading and writing skills (Burnish, T. Fuchs, D., & Fuchs, L.S., 2005; Green, Alderman & Liechty, 2004; Medcalf & Moore, 2002). Others have examined the perception of student peer tutoring in a problem-based learning environment (Solomon & Crowe, 2001; Verba, 1998), how cross age tutoring can influence mathematical ability (Li, 2005; Topping, Campbell & Smith, 2000) and how peer tutoring techniques can be used with students who show evidence of learning and behavior challenges (Brewer, Reid & Rhine, 2003). Research has also examined technology use by Hispanic bilingual teachers (Simonsson, 2004). Coote-Thompson (2007) investigated teachers' perception of combining peer tutoring with technology or integration to increase learning outcomes. Peer tutoring is one among many instructional strategies that can be used to achieve the multiple goals of improving students' cognitive, technological and social skills. Teachers' application of this strategy is dependent on their beliefs regarding the effectiveness of this approach in technology instruction as well as a range of factors. There is a lack of research investigating teacher's perceptions of the use of peer tutoring and the use of technology. This study will address the gap in the literature, and the use of learning activities that could be accommodated within the regular teaching load. Students can benefit from structured in-school helping relationships in which peers assume formal roles as tutors.

Purpose of the Study

The purpose of this research was to investigate teachers' perceptions of the use of peer tutoring and technology (Bloom, 1975; Goodlad, 1979; Grabe & Grabe, 2001; Klaus, 1975; Lengel & Lengel, 2006; Rosenbaum, 1973; Thompson, 2007). Teacher's attitudes towards peer tutoring in technology instruction and integration in Alabama rural and urban school districts were examined. This research identifies common concerns that teachers experience with students' cognitive processes from developmental to information processing.

The objective of this study was to determine whether or not there was a significant and direct relationship to peer tutoring and student success in the classroom through technology instruction and integration. A model was proposed to explain the contributing factors of teachers' attitudes towards peer tutoring in technology instruction and integration. Other variables examined were: gender, age, teaching experience, grade level, and teacher's attitudes. This study also developed a profile of teachers who are likely to utilize direct technology instruction or instruction that involves the use of computers to reinforce learning and to accommodate more collaborative approaches to technology-enhanced instruction as proposed by Coote-Thompson (2007).

Research Questions

The following research questions were used in this study:

1. Is there a difference between gender and teachers' attitudes towards peer tutoring in technology instruction and integration?
2. Is there a difference between grade level taught and teachers' attitudes towards peer tutoring in technology instruction and integration?
3. Is there a difference between teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
4. What is the relationship of age and gender with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
5. What is the relationship of gender and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
6. What is the relationship between gender and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
7. What is the relationship between teaching level and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

8. What is the relationship between age and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

Significance of the Study

This study expects to identify a direct relationship between peer tutoring and student retention rates. This research reflects a common concern about the cognitive processes used in developmental, information processing, or more generally, constructivist perspectives on peer learning. The research from this study is expected to impact program planning and curriculum development. It may also be used as a program by school administrators within educational settings.

This study focuses on peer tutoring fostering the use and understanding of computer technology. The research may point to insights on the type of computer related activities that teachers can incorporate into their instruction to capitalize on the multi-faceted nature of computer technology to build technological, cognitive, and social skills (Coote-Thompson, 2007).

This study emphasizes the importance of teachers focusing on what they do best, designing pedagogical instruction that facilitates learning in every child. The study may refocus education practitioners on considering the how of technology. That is, recognizing the usefulness of technology as a strategy to create more effective learning. For example, using technology in a way that encourages students to think, probe, and collaborate. Teachers may wish to use technology as a tool to accomplish both cognitive and affective learning, by combining technology instruction and integration with a widely known and successful teaching strategy, peer tutoring (Coote-Thompson, 2007).

This approach is consistent with national education standards. The National Education Technology Standards (NETS) established by the International Society for Technology in Education (ISTE), (ISTE NETS)–Standard-3, requires that students use productivity tools to collaborate in constructing technology-enhanced models, preparing publications, and producing other creative works (Carroll & Witherspoon, 2002; ISTE NETS, 2010). The standard also mandates teachers to "use technology to support learner-centered strategies that address the diverse needs of students" (Bitter & Pierson, 2005, p. 5). Since the standard specifies the social framework for technologically literate students, this study, with its emphasis on peer tutoring may point teachers to strategies that they can apply to assist students to acquire these competencies while adhering to education standards (Coote-Thompson, 2007). The following figure illustrates a major component of the National Educational Technology Standards Project. The International Society of Technology in Education's (ISTE) core belief is that all students must have regular opportunities to use technology to develop skills that encourage personal productivity, creativity, critical thinking, and collaboration in the classroom and in their daily life (see Figure 1).

Figure 1. National Educational Technology Standards (NETS) Project.

Source: National Educational Technology Standards for Students, (2007).

The International Society for Technology in Educations' National Education Technology Standards (2012) identified several areas for students to develop technology skills to be productive in a digital world. These include the following:

- Creativity and innovation
- Communication and collaboration
- Research and information fluency
- Critical Thinking, problem solving, and decision making
- Digital citizenship
- Technology operations and concepts

Most related to this discussion of technology skills for digital learning are those listed for communication and collaboration, and technology operations and concepts (see Table 1).

Table1.
Technology skills for Digital Learning

Communication and Collaboration
• Students use the digital divide media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
• Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
• Communicate information and ideas effectively to multiple audiences using a variety of media and formats.
• Develop cultural understanding and global awareness by engaging with learners of other cultures
• Contribute to project teams to produce teams to produce original works or solve problems
Technology Operations and Concepts
• Students demonstrate a sound understanding of technology concepts, systems, and operations
Technology Operations and Concepts
• Understand and use technology systems
• Select and use applications effectively and productively

Technology Operations and Concepts, (continued)

- Troubleshoot systems and applications
- Transfer current knowledge to learning of new technologies

Source: National Educational Technology Standards for Students, (2007).

The International Society for Technology in Educations study suggests that the ability to use technology in a larger context of communication, collaboration, and cultural understanding, coupled with the ability to develop transferrable technology skills are important for students to succeed as information professionals. Instructors are responsible for creating learning environments that enable students to develop these skills and make decisions as to appropriate use for specific tasks.

Another significance of this study is the fact that despite the capability of technology to support learning, its introduction into the curriculum has reinforced differences and inequities in access that mirror the underlying causes of the achievement gap that now drives education reform in the United States (Cross & Parker, 2004; Schwartz, 2001). This study suggests an approach to technology instruction and integration that is more inclusive. In school settings where the computer to pupil ratio is high, teachers may use peer tutoring to facilitate group learning as well as the sharing of resources. Schools in the United States are being held accountable for the academic progress of each child. Educational leaders are capitalizing on the theory of multiple intelligences (Gardner, 1993; US Department of Education, 2010) and using the findings on brain research, and are utilizing technology to address students' individual learning needs. This increase in accountability is not necessarily matched by an increase in allocation of resources. Therefore, teachers need to be creative in adapting and applying strategies that will result in the learning of each child (Coot-Thompson, 2007).

Today's students, being born in the technological age, are often more technologically competent than their teachers. Teachers can capitalize on the computer competencies of their students by assigning peer tutor and tutee roles to them. The extent to which teachers capitalize on the technological competencies of today's students depends on their attitudes towards a peer tutoring approach to technology instruction and integration. This study may help to identify professional development opportunities for teachers who are likely to consider peer tutoring as a strategy for technology instruction and integration (Coote-Thompson, 2007).

It is also worth considering that rapid advances in economic technologies have fueled tremendous growth in the demand for workers skilled in the development and use of technology. Between 1991 and 2001, the number of jobs in professional information technology occupations doubled, increasing from 1.2 million to 2.5 million (US Department of Commerce, 2003). This represents an annual growth rate of 7.2 percent for these technology occupations. A high growth rate in these occupations is expected to continue (US Department of Commerce, 2003). Professional information technology occupations are now known as Science, Technology, Engineering and Math (STEM) occupations. In a more recent report, in 2010, 7.6 million people or 1 in 18 workers held STEM jobs. Although STEM employment currently makes up only a small fraction of total U.S. employment, STEM employment grew rapidly from 2000 to 2010, increasing 7.9 percent. In contrast, employment in non-STEM jobs grew just 2.6 percent over this period. STEM jobs are projected to grow at a fast pace relative to other occupations. From 2008 to 2018, STEM jobs are expected to grow 17.0 percent compared to just 9.8 percent for non-STEM jobs (US Department of Commerce, 2011).

The US Department of Labor Statistics' predicted that, between 2000 and 2010, there would be 2.5 million new technology jobs resulting from the increase in these types of occupations. In a more recent study and unlike many other sectors of the economy, employment in the computer systems design and related services industry, commonly known as Information Technology (IT), services were not significantly affected by the recession of 2007–2009. The industry lost about 1 percent of its employment in 2009 but regained momentum in 2010, when it surpassed the employment numbers from 2008. There was a high demand for the services provided by this industry and it created a large number of fast-growing and high-paying IT jobs (US Department of Labor Statistics, 2011) (see Figure 2).

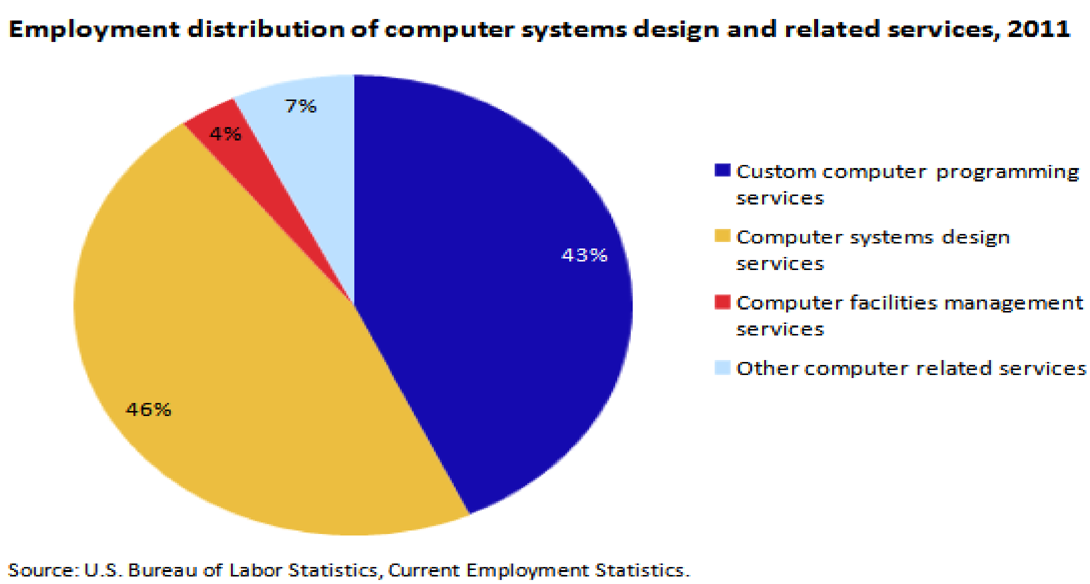

Figure 2. Employment Distribution of Computer Systems Design and Related Services, (2011).

Source: U.S. Bureau of Labor Statistics, Current Employment Statistics, 2011.

Today's students will be future employees. Therefore, schools are expected to equip students with the necessary technological skills and aptitudes to learn new skills for the dynamic workplace. This study is important as it is intended to direct teachers to instructional methods that involve merging technology instruction with cooperative learning strategies such as peer tutoring. This approach may multiply learning outcomes and better equip students for the 21st century workplace (Coote-Thompson, 2007).

Another reason for focusing teachers towards the peer tutoring in technology instruction and integration approach is that cooperative learning strategies "engineer positive contact between groups who would otherwise remain alienated – contact across the divides of age, gender, ethnic origin, and social class" (Topping & Ehly, 1998, p. 4). A peer tutoring approach can be used to deliver computer technology and foster tolerance and cultural awareness among students. This instructive strategy will be useful for education practitioners as they strive to identify ways to socialize students to exist in a diverse society. According to Kushner (2004), students come to school with an awareness of their social status. Efforts made to buffer these differences may foster positive contact in school and help students develop socially.

There is evidence that the number of traditional families in America is decreasing. This may be a factor due to fragmented living environments. According to the Children's Defense Fund (2003), 25% of 10 to 17 year old children suffer from school adjustment problems, challenges that are indicative of further obstacles. Between 15 and 22% of America's youth experience social, emotional and other problems that require mental health treatment (Children's Defense Fund, 2003). In a more recent report, in education, federal competitive grants are motivating states and school districts to design and implement evidence-based reforms to level the playing field in education in order to give poor and minority children an equal chance to learn and thrive. These reform strategies will help close the achievement gap and eliminate racial and ethnic disparities. By rewarding innovation and scaling up programs that improve learning for all students, the US Department of Education is striving to ensure children of color and children who are poor succeed in the classroom (Children's Defense Fund, 2011).

Schools are now being held to higher standards and are agents of change by facilitating learning and peer relationships that produce teachers that are agents and producers of nurturing, caring, cooperative and socially adjusted students as well as contributing to their cognitive development (U.S. Department of Education, 2010). Before initiatives can be developed to refocus teachers toward merging, proven, cooperative learning strategies with technology instruction and integration, it is important to identify the teachers who are most likely to adapt this novel approach to instruction (Coote-Thompson, 2007).

This section has provided an overview of some of the issues that necessitate examination of the attitudes of teachers towards a peer tutoring approach to technology instruction and integration. The issues that necessitate examination for this study include paucity of research on merging technology with a specific collaborative teaching strategy, the need to refocus teachers on focusing on the how of technology rather than the what, and the differing technological competence of students in today's public schools. This study also provided an overview and identified the teachers who are most likely to adapt a peer tutoring approach to technology instruction and integration, the demand for interpersonal and computer skills in the workplace and the need to socialize students to appreciate diversity (Coote-Thompson, 2007).

Definition of Terms

The following terms will be used in conjunction with this study:

1. Attitude - An attitude is an expression of favor or disfavor toward a person, place, thing, or event. Attitude is also measurable and changeable as well as influencing the person's emotion and behavior.
2. Peer Tutoring – A form of Peer Assisted Learning (PAL) that is characterized by specific role taking as a tutor or tutee with major focus on curriculum content and specific procedures for interaction (Topping, 2000). The process by which a competent pupil with minimal training, with a teacher's guide, helps one or more students at the same grade level to learn a skill or concept (Thomas, 1993; Topping & Ehly, 1998).
3. Teachers – K-12 public school instructors. Teachers for this study are sixth, seventh and eighth grade teachers who teach a computer applications technology class and integrate technology in instruction or teachers who teach regular education classes and integrate technology in instruction.
4. Technology – The utilization of computers including the use of both software and the internet to facilitate learning or development of products (Bebell, D., Russell, M., & O'Dwyer, L.M. (2004).
5. Technology Integration - The use of computer technology to enhance the teaching of any K-12 lesson in all subjects including Language Arts, Mathematics, Science and Social Studies.

6. Technology Instruction - The teaching of computer studies as an independent discipline. For example, Computer Applications.

Limitations of the Study

Students are involved in their own classroom environments, which consist of various cultures that are not defined by society, which has an impact on student's cognitive development. Teachers will need to also learn about student's cultures and teach in a manner that is responsive to their cultures.

The results of this study cannot be generalized to the entire population as they represent the attitudes of a group of teachers in Alabama towards a peer tutoring approach to technology instruction and integration. With research studies, there exist certain levels of limitations which result from the method used to conduct the study. This study was designed to identify the profile of teachers who are likely to use peer tutoring in technology instruction and integration. It is not intended to gauge in anyway the effectiveness of peer tutoring on learning technology skills. This survey was limited to teachers who taught 6th, 7th, and 8th grade students in schools in Southeast Alabama, this study did not include any other states or any other areas in Alabama. Likert scales also possess some forms of limitations due to teachers' attitude towards peer tutoring in technology instruction and integration which may have a measure of probability error due to their responses or lack of responses.

Organization of the Study

This chapter introduced the study, presents the problem, discusses the purpose of the study, research questions, definition of terms, and limitations. Chapter 2 includes a review of related literature concerning cognitive development of peer learners while implementing the use of peer tutors. Chapter 3 will report the procedures utilized in this study, including the population and sample; instrumentation; data collection; and data analysis. The findings of the study are presented in Chapter 4. Chapter 5 includes a summary of the study, conclusions, implications and recommendations for further practice and research.

Chapter 2

Literature Review

An overview of the relevant concepts, ideas, theories and research are pertinent to understanding the context of this study. This chapter will trace the history of technology in education in the United States, highlight the influence of the private sector on education and provide a brief outline on the digital divide. The section also explores the role of technology in instruction. Constructivism and the Theory of Planned Behavior, the theoretical bases for this study, are discussed. The section also examines how teachers' philosophies and the five stages of technology adoption may influence their decisions to use a peer tutoring approach to technology instruction and integration. The section presents an overview of peer tutoring and the various peer tutoring models. This section also reviews studies related to peer tutoring and technology instruction and integration. The section culminates with summaries of related empirical studies on peer tutoring and technology instruction and integration (Coote-Thompson, 2007).

The purpose of this research was to investigate teachers' perceptions of the use of peer tutoring and technology (Bloom, 1975; Goodlad, 1979; Grabe & Grabe, 2001; Klaus, 1975; Lengel & Lengel, 2006; Rosenbaum, 1973; Coote-Thompson, 2007). Teacher's attitudes towards peer tutoring in technology instruction and integration in Alabama rural and urban school districts were examined. This research identifies common concerns that teachers experience with students' cognitive processes from developmental to information processing.

The following research questions were used in this study:

1. Is there a difference between gender and teachers' attitudes towards peer tutoring in technology instruction and integration?
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4. What is the relationship of age and gender with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
5. What is the relationship of gender and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
6. What is the relationship between gender and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
7. What is the relationship between teaching level and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
8. What is the relationship between age and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

History of Technology in Education

Computers in education can be traced back to the 1950s when computers were used as extensions of mathematical gadgets, calculators, and slide rules. Technology was used primarily in the fields of mathematics and engineering for solving numerical problems (Lee, 2004). In the early 1960s, computer science began to be offered by universities in the United States as a sub-discipline of mathematics and engineering. The technology was valued for being able to solve complex problems in less time. Designing computer programs was also a feature of computer education. There is evidence that the process of developing programs would help students to solve problems independently (Lee, 2004). This trend continued until the 1960's when computers began to be used for non- numerical functions, an activity that evolved into the introduction of computer aided instruction (CAI) (Coote-Thompson, 2007).

Computer aided instruction (CAI) used synonymously with computer assisted instruction, became widespread when the Worldwide Web (WWW) became accessible to a significant portion of the United States population. Computer Aided Instruction, a self-learning technique, usually offline or online, involving interaction of the student with programmed instructional materials. Computer Aided Instruction (CAI), is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place (Means, Padilla, Penuel & Penuel, 2001). CAI uses a combination of text, graphics, sound and video in enhancing the learning process. The computer has many purposes in the classroom, and it can be utilized to help a student in all areas of the curriculum. CAI refers to the use of the computer as a tool to facilitate and improve instruction. CAI programs use tutorials, drill and practice, simulation, and problem solving approaches to present topics, and test students' understanding. There are six types of computer aided instruction methods (Means, Padilla, Penuel & Penuel, 2001):

1. Drill–and-Practice – Drill-and-Practice provide opportunities for students to repeatedly practice the skills that have previously been presented and that further practice is necessary for mastery.
2. Tutorial - Tutorial activity includes both the presentation of information and its extension into different forms of work, including drill and practice, games and simulation.
3. Games - Game software often creates a contest to achieve the highest score and either beat others or beat the computer.
4. Simulation - Simulation software can provide an approximation of reality that does not require the expense of real life or its risks.
5. Discovery - Discovery approach provides a large database of information specific to a course or content area and challenges the learner to analyze, compare, infer and evaluate based on their explorations of the data.
6. Problem Solving – Problem solving approach helps children develop specific problem solving skills and strategies.

Business majors were among the first set of students to benefit from computer-aided instruction. They used computers mainly during summer school programs to simulate ("SIM" ©) their involvement in manufacturing and marketing processes (Lee, 2004). "SIM" © is also used in flight training in the military and provides hands on experience in visualizing complex systems such as zoning, transportation, budgeting, pollution, crime, and land value. Although time consuming to construct, simulators are valuable teaching aids (Coote-Thompson, 2007; Wolffe, 2002, 2007). In 2008, SIM Technology was awarded as a "Top 50 global emerging - market enterprise" (SIM Technology, 2008, para. 6). As one of the 15 selected Chinese enterprises, SIM Technology is considered one of the outstanding representatives of the national enterprises taking the lead in the local market through its innovative business mode and leading technology.

Following SIM ©, the Programmed Logic for Automatic Teaching Operations (PLATO ©) system was introduced in 1960. This system is used to deliver individualized instruction to large group of students over a wide geographical area. Other teaching and testing systems that supported individual teaching and learning environments emerged (Woolley, 1994). Blackboard ©, (2013) for example, provides a comprehensive set of enterprise software products and services that makes e – education (electronic online – education), in college, university, and international education settings possible. Likewise WebCT ©, a widely used instructional software was developed to satisfy teachers' needs for technology that fosters student inquiry, discourse, and collaboration (Lee & Impagliazzo, 2004). Through the development of these programs there are a plethora of Computer Aided Instruction programs being utilized by local education agencies, such as, Webinars, Web2.0 and Kuder, A+. In web 2.0's early days (2004 – 2008), blogging applications such as Blogger or WordPress and wiki environments such as Google Sites, PB Works, and Media Wiki received much attention as collaborative learning tools promoting writing and creative expression. Some saw them as alternatives to classroom management tools (Davi, Frydenberg, & Gulati, 2007), as faculty members sought ways to bring these collaborative tools into the classroom. Since that time, blogs, wikis, Google Drive, and YouTube videos have become classroom mainstays, while several recently developed tools have enabled new types of group collaboration.

The advent of real–time, synchronous Web–based communication tools such as Skype and Google Hangouts have fostered the opportunity for a number of learning activities that were not previously possible or accessible. Technology changes each year with the discovery of new communication tools that may lend themselves to effect global collaboration among teachers and students.

The last half of the 20th century was considered the information age. The Information Age, also known as the Computer Age, Digital Age, or New Media Age, is a period in human history characterized by the shift from traditional industry that the industrial revolution brought through industrialization, to an economy based on the information computerization. The onset of the Information Age is associated with the Digital Revolution, just as the Industrial Revolution marked the onset of the Industrial Age (U.S. Department of Education, 2010). It was also characterized by appeals from governmental leaders for every classroom to be connected to the information superhighway with computers, appropriate software and training for teachers (U.S. Department of Education, 2010). Prior to this emphasis on technology in schools, two government reports highlighted the status of computers in public schools (Becker, 1994). The first report, called *Power On,* disclosed that in 1983 the national average was one computer to 100 students. Based on this finding, the report recommended that more funding be allocated for lowering the computer student ratio. A decade later, a second report commissioned by the Office of Technology Assessment revealed that computer hardware was available in public schools but teachers had difficulties using them (Becker, 2000; Coote-Thompson, 2007).

In 2001, 99 percent of US public schools indicated that the Internet was accessible to their students. This represented an increase of 35 percent from 1994 (Kliener & Farris, 2002). However, Internet access in public schools in high poverty areas with large minority enrollments was lower. Approximately 81 percent of these schools had access to the Internet. However, technology access did not necessarily result in effective integration of computers into instruction (Sheeky, 2003).

More recently, the federal education mandate, No Child Left Behind of 2001, lists among its primary goals as “improving student academic achievement through the use of technology in primary and secondary school” (Bitter & Pierson, 2005, p. 90). This was the catalyst for continuous professional development in technology integration in schools. Research on technology instruction and integration has pointed to best practices. It has also raised questions pertaining to whether computers made students smarter, such as how beneficial is the technological revolution for students? And how does technology alter classroom teaching and learning behaviors? (Bitter & Pierson, 2005).

Alabama is poised to lead the way in digital learning in the coming decade. Alabama’s students are expected to graduate and compete among graduates, not only within the southeast, but with students across the nation and the world, as information technologies permeate all professions globally. Palfrey & Gasser (2008) indicated that while equal access to technology has been the driving force over the last decade, “it is more apparent that access is not enough. Education must incorporate digital literacy and responsibility in a more connected world” (p. 4).

Recently, Alabama State Department of Education (2008) adopted a technology initiative, called IMPACT (Indicators for Measuring Progress in Advancing Classroom Technology), which reveals that Alabama's goal of technology fluency for every student necessitates the seamless integration of technology and twenty-first century skills throughout the curricula. The immersion of technology into the curriculum provides an engaging means for students to locate, assemble, and apply relevant information to make connections with essential knowledge.

The overarching purpose of IMPACT is to improve learning through the use of technology. The four goals of IMPACT are outlined in Table 2 which provides a framework for the design of local schools and school districts technology plans for integrating technology across the curriculum (Alabama State Department of Education, 2008). The vision of IMPACT is to leverage the unique powers of technology to provide challenging, stimulating learning opportunities for students throughout the state. This vision is further articulated into four component goals. These goals are intended to support the vision and provide a framework for the design of local school and school district technology plans. Further, the goals and objectives exist as the framework for assessing the state of Alabama's progress toward advancing classroom technology across the state. Data collected on the status of this progress is reported to the U.S. Department of Education as part of federal reports. Due to the confluence of federal, state, and local funding streams, the results shared in this report represent an overall picture of the use of technology in Alabama. Therefore, disaggregation of use by funding source is not available. Table 2 illustrates the four goals for Alabama Department of Education as outlined in IMPACT.

Table 2.
The Four Goals for Alabama outlined in IMPACT.

Goal 1: TECHNOLOGY INTEGRATION AND MASTERY OF STANDARDS
All Alabama students, teachers, and administrators will effectively use technology as an integrated tool for teaching, leading, and learning to master local, state, and National standards.
Goal 2: EXPANDING OPPORTUNITIES THROUGH TECHNOLOGY
All Alabama students, teachers, and administrators will benefit from a broad range of educational opportunities and resources through the use of technology.
Goal 3: TECHNOLOGY PROFESSIONAL DEVELOPMENT
All Alabama teachers and administrators benefit from high-quality, research-based professional development and supports necessary to achieve local, state, and National standards and courses of study.
Goal 4: TECHNOLOGY INFRASTRUCTURE
All Alabama students, teachers, and administrators will have access to the appropriate technology resources and infrastructure necessary to support teaching, leading, and learning.

Source: Technology in Alabama Public Schools – 2009

Effectively integrating technology can extend learning beyond the classroom to ensure that all students achieve the technology fluency necessary to succeed in a global society. There has also been a shift in educators' perceptions of what children should learn about computers and the impact that technology would have on their role as teachers (Coppola, 2004).

In the 1980s, when computers were placed in schools, many teachers believed that the technology would change instructional delivery and the culture of the classroom. Education leaders believed that instruction would mirror the approach that is applied in designing instructional software and that the presence of micro-computers in the classroom would change the way students learn and the structure of schools (Coppola, 2004). Education programs were written by software engineers without input from educators. Teachers and schools were excluded from technology planning. It was in the late 1980's and early 1990's that education reformers realized that input from teachers was necessary for designing individualized and independent learning environments for their students. The rationale for this approach was that technology should not alter the culture of the classroom (U.S. Department of Education, 2004). Characteristics such as student-centered instruction which is an approach that promotes student engagement through various activities and that define best practices in teaching should remain even with the introduction of technology (Coote-Thompson, 2007).

Practitioners and researchers are now paying more attention to the influence of computers on classroom culture. One of the most profound effects is its indication of change coupled with encouraging new thinking, forcing increased collaboration among teachers in their effort to learn technology and facilitating new roles and relationships among students in the classroom (David, J.; Dede, C.; Sheingold, et. al 1990 and K. & Tucker, M., 1990). Some researchers argue that computers would only magnify existing practices rather than alter instruction (Cohen, 1987; Cuban, 1986). For example, a survey conducted by the National Center for Education Statistics (2000) found that thirty nine percent of public school teachers with access to computers or the internet in their classroom or elsewhere indicated they used computers or the Internet “a lot” to create instructional materials, and 34 percent reported using computers “a lot” for administrative record keeping. Best practices in technology integration should result in developing understanding and higher level thinking (Schwartz & Willing, 2001).

This section has reviewed some of the history of computers from its introduction as an extended mathematical aid to the introduction of SIM © and PLATO © systems followed by more recent studies that presented new models of computer aided learning. The following section will examine the private sector's influence on education.

Private Sector Influence on Education

Teachers of instructional technology are encouraged by corporate companies in the United States to prepare students to acquire competency in computer technology that will equip them to add value to their organizations and subsequently society (Ornstein & Hunkins, 2004). The expectation of schools to assist students in developing computer skills is plausible, if one limits the purpose of education to preparing students for the workplace. Reflecting on John Dewey, whose work focuses on the goals of education, Ornstein and Hunkins (2004) posit that "we not only wish to make good citizens and workers but we ultimately wish to create human beings who will live life to the fullest", (p. 33). The purpose of education is to bring out, develop, and empower through knowledge to help others develop their own conscious value system and make informed choices even if they are different from ours (Coote-Thompson, 2007; Topping & Ehly, 1998).

Sometimes the teaching of technology is geared towards developing technical competence with less consideration being given to these social and affective benefits. Rarely do teachers consider the potential of technology to enhance students' self-esteem and social and emotional intelligences (Cohen, 2001; Coote-Thompson, 2007).

Students are being prepared to enter a world whose competitiveness is greatly influenced by technology. Children need to be able to compete and computer competency does give them the edge to do so. It is equally important for them to possess the ability to cooperate because time would be spent unproductively on competition in a society that is full of individualists (Topping & Ehly, 1998).

Information technology employees who were asked in a survey to identify the characteristics and training that they found effective showed a strong preference for on-the job training, especially under the tutelage of an experienced mentor (US Department of Commerce, 2003). Employees who had been accustomed during their schooling to teaching themselves to teach others can easily make the transition to information technology tutors at the workplace.

Role of Technology in Instruction

Educational technology, sometimes termed EdTech, is the study and ethical practice of facilitating e - learning, which is the learning and improving performance by creating, using and managing appropriate technological processes and resources. Educational technologies are valued for their usefulness in adding variety to the range of teaching, learning and communication modes (Bitter & Pierson, 2005; Cuban, 2005; Jonassen, Hernandez-Serrano & Choi, 2000; Ross, McGraw & Burdette, 2001). Likewise, they are effective in engaging students more deeply in a topic, fostering ownership for their learning and communicating their projects and ideas more clearly. To foster a more positive attitude toward integrating technology in the classroom, it is important to instruct teachers about ways of incorporating technology in their teaching repertoire by combining it with existing pedagogical approaches such as peer tutoring. Research has identified that effective technology-enhanced pedagogy can result in a variety of educational outcomes (Bitter & Pierson, 2005; Cuban, 2005; Jonassen, Hernandez-Serrano & Choi, 2000; Ross, McGraw & Burdette, 2001):

1. Increased learner motivation,
2. Mastery of advanced topics,

3. Increased production and application of knowledge,
4. Increased ability for students to manage their own learning,
5. Improved access to information that increases knowledge, inquiry, depth of research,
6. Improved achievement for students with special needs, and
7. Better results on standardized tests.

Since the second half of the 21st century, computer access has increased. The US Census Bureau reports that in 2001 the ratio of computers to students in the United States public schools was one to 4.4. With a school population of 47.8 million, there were 10.8 million computers in public schools at the time. Schools spend an average of $114 per student for technology expenses with only a mere $22.50 being allocated for teacher support services. While there are benefits to this type of investment, the initiative for school's to use technology outweigh the schools' ability to provide exceptional instructional experiences for students (Coppola, 2004).

Brunner and Tally (1999) found the following:

> Fixated on new technologies, excited by their capabilities, or preoccupied with their new demands, we forget the far more important relationships and interactions that the technologies are in schools and in classrooms to support. (p. 22)

In other words, while technological competence is important for teachers, they should not overlook the human side of technology in education. Brunner and Tally (1999) compared the use of computers in two schools. In the first school tenth graders, mostly African American and Latino, each sat at a work station in an updated computer lab and worked for fifty minutes through well-designed computer guided exercises in biology, algebra and American history. There was limited teacher intervention as the computer offered prompts and gave students other chances when they got responses wrong.

In another setting, ninth graders filed into their computer lab where teams of students worked at six computer stations. They had been working on their social studies projects for three weeks, which required them to unearth an archeological site in ancient Greece. Each student was responsible for electronically excavating one of four quadrants for the site. They excavated pieces of weapons, ancient texts, masonry and pottery. They interpreted each artifact and determined where each fit in the overall site.

Both schools used state of the art computers to individualize, focus and perhaps humanize learning. However, in the second school technology was used to help students to go beyond merely information processing. They learned to interpret images, architecture and art from cultures that existed hundreds of years before the children's existence. Both scenarios represented schooling for the information age and schooling for the twenty first century workplace. However, the approach by each teacher reflects different visions of teaching and learning and possibly varying student outcomes (Coote-Thompson, 2007).

In the first instance, technology was used as a means of achieving content mastery and students interacted mainly with the software, rather than each other and adults. In the second instance, learning through technology was understood broadly as the ability to use one's mind in framing and solving problems in novel ways, through coordinating complex activities with others. This is the aspect of technology instruction and integration that is the focus of this study. The approach to the second study is related to the purpose of this study to examine the use of peer tutoring, a form of collaborative learning in technology instruction and integration (Coote-Thompson, 2007).

Means, Padilla, Penuel, Penuel and Padilla (2001) contrast technology use by teachers in schools with many low-income students and those from schools with affluent students. Computer use in low achieving SES (Supplemental Educational Services) serviced schools is often limited to very traditional beliefs about student learning while computer use in high SES schools demonstrated constructivist and innovative teaching strategies (U.S. Department of Education, 2009). Low-income families can enroll their child in supplemental educational services if their child attends a Title I school that has been designated by the State to be in need of improvement for more than one year. The term "supplemental educational services" refers to free extra academic help, such as tutoring or remedial help, that is provided to students in subjects such as reading, language arts, and math. This extra help can be provided before or after school, on weekends, or in the summer.

Another difference that was cited by, Means, Penuel and Padilla (2001) was computer versus student control between the two groups. The emphasis in middle class schools is teaching students to create with technology rather than learning from technology. In other words, the students assume control. In contrast, instruction in low SES schools restricts computer use to simply delivering information or basic skills practice sessions (Coote-Thompson, 2007).

Galin and Latchaw (1998) emphasized the role of communication between teachers and students. According to them: External dialogue between teachers and students regarding technology use, may lead to reflection or internal dialogue by the teacher regarding the approach to technology integration. They presented a series of questions that might draw attention to the "how" of technology. In evaluating technology use, teachers may ask: "What is the nature of the content? Why is technology being introduced? What can the computer do, that cannot be done in other ways? What implications, consequences, and results might be expected in the computer-facilitated activity?" (p. 5). Through this process of rethinking it is hoped that teachers recognize the ability of technology to foster discourse and social interaction.

The previous section examined the role of technology in the classroom. Teachers' perceptions of how their role might change with the introduction of technology into the classroom were also explored. The following section will examine the digital divide and factors that has long been an impediment to universal technology access.

The Digital Divide

In the earlier times, the early nineteenth century, if one grew up in a text-rich environment, one was expected to perform better academically than one's peers who did not. Similarly, school age children who have access to their own computers with Internet access might be expected to perform better in schools than other students who do not (Eamon, 2004). Currently, approximately half of the school aged children in the United States have this access, meaning that some students are affected by the digital divide or the gap between students who have access to computers and those who do not (Servon, 2002). Simply owning a computer and subscribing to the Internet does not necessarily guarantee connectedness. It is what a person does with the computer that matters (Gorski & Clark, 2003; Lengel & Lengel, 2006). Many students use computers predominantly for recreational activities including e - mail, instant messaging, downloading music, playing games and digital video discs (DVD).

Academic use of the computer may be limited to writing school papers. It is this digital divide that concerns Lengel and Lengel (2006).

> If these new and powerful tools in the hands of our young people end up focused on trivial pursuits, if they become defined by the society as grown-up Game boys and if we find ourselves as educators on the wrong side of the divide, we will have lost a major battle with the forces of ignorance. (p. 8)

Similarly, if educators ignore the potential of technology to facilitate human relations skills such as cooperation and team building, if they fail to assign technology-related tasks that force students to collaborate, problem solve and pool their ideas, they would have missed opportunities to maximize on utilizing technology to equip students who are well suited for the twenty first century workforce. (Coote-Thompson, 2007).

Constructivism and Technology Integration

Applying the constructivist theory with technology integration can allow students to work to their fullest potential. The constructivist theory suggests that students are given tools to construct their own knowledge. Constructivist learning wants the educators to adopt the idea that each learner will construct, obtain, and interpret their own knowledge differently. Constructivism is an active process and allows the students to make sense of their world (Adams, 2006). Peer tutoring is under-girded by constructivist theory. This educational concept focuses on the nature of knowledge, epistemology, and learning. The theory regards the learner as the key player in constructing new ideas or concepts based on previous knowledge and new experiences (Phillips, 2000). Further, constructivism encourages independent thought, creativity, and intuitiveness.

Glaserfield (1985) argues that there is some looseness of fit between what defines constructivist theory and constructivism that is practiced in the contemporary classroom. He observed that constructivism manifests itself in the modern day classroom by students engaging in some form of inquiry activity. That is, they construct knowledge by creating and testing their own hypotheses. They also explore their environment and question their knowledge to facilitate reflection.

The teacher supports this initiative by providing complex problems and multiple solutions, promoting ownership in learning, introducing new pedagogies and exploring rather than dismissing wrong concepts. This approach is amenable to a peer tutoring approach to technology instruction and integration. Students with varying or similar ability, thought and interest can be paired to complete tasks that require discovery and inquiry. This collaboration process can result in creating more complex and interesting products. The challenge for the tutor to guide a tutee through a technological process, as well as the peer support received by the tutee, will add the social dimension to the task. That is the building of collaborative, interpersonal skills as well as the boosting of self-esteem (Coote-Thompson, 2007).

Phillips (2000) has identified two dominant western concepts that characterize constructivism: empiricism and rationalism. In empiricism, he notes, all knowledge is grounded in experience, whereas rationalism in the mind contributes to the construction of knowledge. This has implications for technology integration. If students are to be the key players in constructing knowledge, teachers should assign activities that will foster collaboration between students of varying abilities and levels of technology competence. Shapiro (2000) points out that constructivism attributes to the respect for students' abilities and students' autonomy. Students' technology competencies, combined with their natural affinity to explore, are assets that teachers can capitalize on in developing constructivist – type instruction. Shapiro (2000) points to less obvious outcomes of constructivist education: learners dealing more constructively with conflict, learning to set goals and directions, learning to manage one's time, improved decision - making skills and improving general people skills that are required to thrive in an increasingly complex society. In the context of technology integration, opportunities for collaborative learning and partnerships such as peer tutoring can be used to assist students in developing these attitudinal skills. This suggests that teachers should encourage collaborative, problem - based and inquiry - led learning and cognitive apprenticeships. Without giving up total control of their class, teachers should create environments in which diverse students can work in teams, assign tasks based on their strengths, resolve their differences and generate meaningful outputs.

The call for education reform stems from the observation that discipline centered curriculum, which focuses on what we think rather than how we think, is not producing scholars who have the appropriate affective skills to reform society. This observation was reinforced by the 1983 Nation at Risk Report (Cross, 2004). Shapiro (2000) points out that the traditional approach to teaching, in which the teacher largely lectures, isolated students from each other and from the teacher. In a recent report, by the U.S. Department of Education (2012), thirty years later, schools remain somewhat the same; therefore, instructional strategies should be informed by the demands of the workplace.

In the industrial era, instruction was based on behaviorist thinking where emphasis was placed on action and outcome. Jobs were based on repetitious tasks that did not require much thinking. Workers merely performed their tasks from guided instructions. Interpersonal and problem solving skills were not stressed in these settings. However, in the contemporary, post-modern society, production requires that people learn to collaborate to complete tasks and solve problems (Rosenburg, 1990). If schools are to equip students to function in this environment, educators will have to consider adapting their instructional strategies to reflect constructivist thinking (Coote-Thompson, 2007).

Ornstein (2004), inferred that problem solving and critical and reflective thinking skills result from a constructivist learning model. This equips students to deal with problems in other content areas, as well as challenging situations that they face in their everyday life. As students who had been accustomed to understanding concepts through trial and error and generating ideas and possible solutions by identifying available information related to a problem, it would be natural for them to apply the same techniques to any context. Ornstein and Hunkins (2004) posit that a persons' understanding and interpretation of information will be different as their ideas are based on their own experiences. However, conclusions, though subjective, can be reached as learners may compare their concepts with that of their peers or teachers and where appropriate, re-structure their understanding (Coote-Thompson, 2007).

Vygotsky (1986), a Russian social and developmental psychologist, highlights the role of language in shaping an individual's construction of knowledge. He describes it as the medium through which students, their peers and teachers can influence understanding. Constructivism empowers students to set learning goals and instructional strategies. This means including experiments in peer group settings and questioning to refine and develop students' inquiry skills. Teachers should develop assessments that are supportive of collaborative learning, promote ownership in learning, as well as coach and guide learners who lack pre-requisite skills. This may have a great impact on education. Students as self-directed learners may be more motivated to pursue higher education and want to learn for the sake of learning (Harrison, 1999). Teachers may also re-examine how they perceive disruptive students as many of them possess creativity that needs to be redirected (Coote-Thompson, 2007).

Constructivism gained more significance as it became apparent that the traditional or classical teaching methods were producing students who lacked critical life-coping skills. Politicians since the 1980's have been advocating for accountability and results that are equivalent to the educational tax dollars that have been spent. Research has shown that teachers have the most impact on the quality of technology used in schools (Levin & Waldmany, 2008). Teachers' willingness and commitment to integrating technology is important. To be more specific, teachers need to be involved in two changes. They must first learn how to use technology themselves, and second, they must fundamentally change how they teach. Once an educator has made this commitment, they must consider many aspects when choosing specific technology. To coincide with the constructivist theory, higher order thinking skills must be supported at all times (Coote–Thompson, 2007).

Theory of Planned Behavior

Since peer tutoring is being proposed as a pedagogical strategy to be utilized in technology instruction and integration, it is important to examine teachers' attitudes toward this approach. The Theory of Planned Behavior (TPB) may serve as a basis for examining the cognitive foundations for behavioral decisions (Ajzen, 1988). The

Theory of Planned behavior offers an avenue for investigating the process that teachers take to decide whether or how to use technology in their instruction. Ajzen (1988), in his theory notes that a variety of factors can interfere with intention - behavior relation. Personal deficiencies and external obstacles are factors that are likely to disrupt the performance of any behavior. Ajzen (1988), further explained that success in carrying out the intended behavior is dependent on the extent to which persons are able to control factors that may prevent it (see Figure 3).

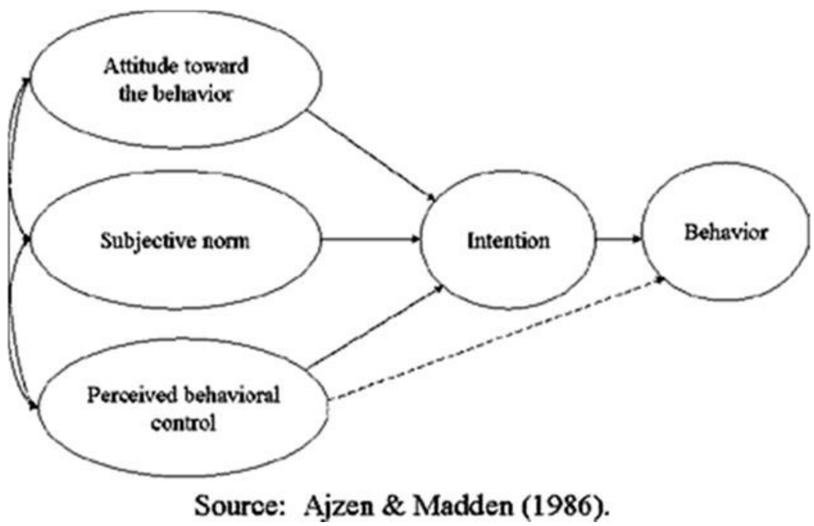

Figure 3. The Theory of Planned Behavior Model

Source: Ajzen & Madden, 1986.

With regard to peer tutoring, teachers may have the desire or intent to use it in technology instruction and integration. However, they may be constrained by time, size of the class and assessment guidelines. Ajzen (1988) suggested that there is a correlation between attitude and perceived behavioral control. That is, the more positive the attitude with respect to the behavior, the stronger the individual's intent to perform the behavior. Therefore, teachers who have favorable attitudes towards a peer tutoring approach to technology instruction and integration are more likely to apply this strategy to technology instruction and integration than their colleagues who do not (Coote-Thompson, 2007). The behavior, the attitude towards the behavior and the motivation to comply were examined. The behavior of interest is using a peer tutoring approach towards technology instruction and integration.

The Theory of Planned Behavior also establishes a link between teachers' underlying beliefs and their approach to technology instruction and integration. The Theory of Planned Behavior assumes that perceived behavior control is carried out when individuals are motivated to do so. In many situations perceived behavioral control is unrealistic. For instance when persons are not familiar with the behavior, when requirements or available resources have changed, or when additional elements have been introduced into the situation (Ajzen & Madden, 1986).

In the current educational climate, schools' operations are controlled by State mandated policies. For example, emphasis on reading, or preparation for state tests, might determine teachers' decisions to focus on these areas and disregard constructivist type instructional strategies such as peer tutoring. Similarly when there is a reduction in education funding, administrators are forced to identify areas for reduced spending.

Availability of technological resources is not always considered to be a high priority area (Coote–Thompson, 2004). Therefore spending and budgetary allocation are sometimes reduced for this type of resource. When teachers are faced with situations like these, they adjust their teaching strategies to match the realities of their teaching environments (Coote-Thompson, 2007).

The Theory of Planned Behavior suggests that the more resources and opportunities individuals think they have, the fewer impediments or obstacles they anticipate, the greater should be their perceived control over the behavior. This section outlined constructivism and the Theory of Planned Behavior and how their teachings can be applied to validate the use of peer tutoring in technology instruction and integration.

Teachers' Philosophies

Teachers' decisions to utilize instructional strategies will be driven by their educational philosophies. Four major philosophies, idealism, realism, pragmatism and existentialism, have influenced education in the United States (Ornstein & Hunkins, 2004; Webb, Metha & Jordan, 2007). Generally, an individual's philosophy is determined by their perception of the nature of knowledge and the nature of value. Idealism, a traditional philosophy is concerned with the mind, morals, and the truth. Some idealists believe that individuals are capable of aspiring to wisdom that will eventually improve the quality of their ideas. This is accomplished by adopting, moving and multiplying thoughts (Coote-Thompson, 2007).

Teachers who hold idealist philosophies might be more likely to adopt a peer tutoring approach to technology instruction and integration. They are likely to appreciate the goal of education to create moral beings. As part of the process of doing so, they will encourage students to help each other. This is consistent with Bruner's (1973) idea that schools ought to be communal. Arguing for cross age tutoring, and giving older student's responsibility for assisting younger children, they would gain a sense of purpose that is so often lacking in their lives. A student assisting another to learn is the primary goal of peer tutoring.

Unlike idealists, realists see the world as objects and matter. Teachers who are philosophical realists, might view technology and peer tutoring as separate and discrete concepts. Therefore, they might not appreciate the usefulness of merging both to maximize learning outcomes. They are also less likely to consider the affective components of learning (Coote-Thompson, 2007).

Pragmatism is classified as a contemporary educational philosophy that focuses on change, process and relativity (Ornstein & Hunkins, 2004; Webb et al, 2007). It also recognizes the importance of context to the process of learning. The process of how to think rather than instructing the learner on what to think is central to this philosophy. Therefore teachers who are pragmatic in their philosophical orientation may consider peer tutoring as an instructional strategy. However, they are more likely to emphasize the facilitator role of the tutor. That is, the cognitive processes such as communication between the tutor and tutee are assessed; usually this is characterized by prompting, questioning, and reinforcement.

Existentialism stresses individualism and personal accomplishment (Ornstein & Hunkins, 2004; Webb et al, 2007) - a goal that is counter to the peer tutoring ideals. However this philosophy is relevant to peer tutoring if the assigned tutor feels a sense of personal accomplishment after assisting a peer to learn a technology task. Conversely, if teachers are advocates of ranking and competition, they might not be amenable to peer tutoring as an in instructional strategy. They are likely to avoid any instructional practices that affect students' rank or position within the class.

Idealists, pragmatists and, in some instances existentialists may be likely to embrace peer tutoring as a pedagogical strategy for technology instruction and integration. Realists might not since they may perceive the two as separate entities (Coote-Thompson, 2007).

Stages of Technology Adoption

In addition to their educational philosophies, the stages of technology adoption are another consideration for teachers' likelihood to merge peer tutoring techniques with technology (Romano, 2003). The Apple Classrooms of Tomorrow (ACOT) program was developed in the 1980's to gauge teachers' professional development in integrating technology into their school curricula. Essentially, teachers were provided with computer access, advised to integrate it into their instruction and reflect on their experiences in journals. The journals were analyzed after ten years of data collection. The research revealed that teachers experience a sequence of five stages from the time computers arrive in the classroom to when the teachers initiated creative ways to integrate technology into the curriculum. Teachers who completed the survey were at one of five stages of the continuum: entry, adoption, adaptation, appropriation, and innovation (Lengel & Lemngel, 2006; Sandholtz et al. 1997).

Entry: The teacher knows that the technology exists but opts not to use it. These teachers are usually effective in other areas of instruction. They simply do not see the link between technology and their core responsibility of teaching the curriculum (Lengel & Lemgel, 2006).

Adoption: The teacher selects one or two technology tools that best suit their work style. Usually they increase productivity and might not necessarily be directly related to the task of teaching. They may, for example use email, word processing and Photoshop. Teachers in this category perceive technology as a subject that is taught independently. Usually they are reluctant to allow students to use computers in their classrooms because of their fear of troubleshooting difficulties that they are unable to resolve. (Lengel & Lemgel, 2006).

Adaptation: The teacher makes an attempt to use some technology with the students. Usually technology use is limited to word processing and assigning each student to create similar documents. At this stage, technology use results in no value added benefits as the computer use is merely added on as another layer onto the instruction. Typical activities at this stage might involve students doing writing assignments on lined paper for transcription on a computer (Lengel & Lemgel, 2006).

Appropriation: This stage is characterized by excess. The teacher integrates technology into a variety of curricular activities. The teacher also tries out new technology and seeks funds to procure technology equipment that is proven to enhance instruction (Lengel & Lengel, 2006).

Innovation: Teachers at this stage are more selective in the use of technology. They focus on the curriculum and use technology as a tool to enhance teaching. Innovative teachers are not dazzled by digital images. Instead they focus on content, standards and the use of appropriate media. They use well- designed rubrics to assess students' performance (Lengel & Lengel, 2006).

Teachers who utilize peer tutoring in technology instruction or integration are likely to fall in ACOT's appropriation or innovation stage. They have deep appreciation for the role of technology in enhancing instruction and are motivated to use creative strategies with technology to accomplish more positive learning outcomes (Coote-Thompson, 2007).

Overview of Peer Tutoring

One of the goals of this research is to examine the factors that contribute to teachers' attitudes towards peer tutoring in technology instruction and integration. This section provides an overview of peer tutoring, a strategy that can be merged with technology instruction and integration to yield a range of affective and cognitive learning outcomes (Coote-Thompson, 2007).

Peer tutoring is one form of Peer Assisted Learning (PAL). Generally, it is characterized by assigning a student or tutor to coach or train a peer or tutee in learning a specific skill or concept. The strategy has been practiced successfully for years to improve student achievement in several areas including reading, mathematics and second language acquisition. A brief examination of the history of children-teaching-children strategies will place into perspective the peer tutoring approach to technology instruction and integration that is investigated in this research.

In the early nineteenth century, the frustration experienced by Andrew Bell (1789), as cited in Topping (2000) when he taught sons of British soldiers in India led him to experiment with assigning older children as teachers, a practice that is now referred to as cross-age tutoring. Due to its success in improving student learning, Bell's model became well - known. The model was adapted and used in Britain by educator Joseph Lancaster who valued the system for its recognition of the social nature of learning (Allen, 1976). Under the Bell-Lancaster (1789) system the children who served as tutors were trained to deliver instruction using the drill and practice strategy that characterized teaching during that era. Despite this, proponents recognized the social and cognitive benefits for both learner and teacher who engage in peer tutoring partnerships.

Though current peer tutoring partnerships are less rehearsed, the practice of tutors mirroring the teaching style of teachers has influenced current peer tutoring techniques. Best practices in peer tutoring involve giving peer tutors scripts (Gillespie & Lerner, 2004; Topping, 2000; Goodlad, 1998). However, the drill and practice approach to peer tutoring is inappropriate for the type of technology instruction and integration that is investigated in this research. The cooperation and other social skills that it facilitated during its first introduction in instruction are still relevant and applicable to this study.

With the current emphasis on technology competence, perceptions of teachers' attitudes towards utilizing peer tutoring in instruction that involves technology will be explored. An awareness of the variety of peer tutoring models that exist might help educators who may be interested in utilizing this approach in technology instruction and integration (Coote-Thompson, 2007).

Peer Tutoring Model

Peer tutoring is a flexible, peer-mediated strategy that involves students serving as academic tutors and tutees. Typically, a higher performing student is paired with a lower performing student to review critical academic or behavioral concepts.

Peer tutoring models are flexible and can be altered to meet individual student or class learning needs (Fulk, & King, 2001). The academic task should dictate the appropriate model based on content and learning goals. While there is some upfront planning and instruction, once students develop an understanding of procedures, groups or dyads can be altered dependent upon the setting, activity, or desired learning outcomes (Fulk, & King, 2001). This section will examine two peer tutoring models, which includes pairing students and cross–age tutoring.

Classroom settings are as varied as the abilities of the students within them. No one peer-tutoring model will be applicable for all instructional contexts. This section will highlight the features, strengths, weaknesses and underlying theories of some peer tutoring models. Pairing students according to their ability appears to be the most familiar peer tutoring model (Fulk, & King, 2001). In this model, pairing a high ability student with a less competent student for coaching in reading, mathematics or other appropriate instruction is applied. The positive results that are accomplished from using this model are similar to cross age tutoring in which an older child is assigned to tutor, a younger child. Significant academic improvement results from this type of partnership. Studies also show that the tutors' performances improve as much as or more than that of the tutee (Brewer et al., 2003; Green et al., 2004; Topping & Smith, 2000).

Tutors do not have to be the smartest children in the class (Gillespie & Lerner, 2004). Students were born into a technological world that is different from that of their teachers. This gives them a technological advantage that even with years of training and practice some teachers might never attain. Selecting students as tutors can build their self-esteem and motivate them to learn concepts and skills that they would otherwise have taken less interest in mastering.

Sarbin (1976) uses role theory to explain what would cause a twelve year old child with no pedagogical training to teach a younger child a skill that a teacher might not be successful in doing. The author argues that the nature of the tutor-tutee relationship contributes to favorable outcomes. The acquisition of knowledge seems to be intertwined with the perception by the tutee that the tutor is a friend. This is manifested in portrayal of humor, warmth, kindness, and freedom to exchange information that is considered to be personal. Sarbin (1976) found that tutor-tutee relationships that were similar to the teacher-student interaction, but yielded less promising outcomes than those friendship-type tutor- tutee relationships.

Other theorists believed that pairing slow learners motivates them to learn from children with similar difficulties (Briggs, 1998). The underlying theory for this model is cognitive constructivism. Cognitive constructivism emphasizes that individuals learn by placing them in situations where they are active in learning, thinking, and knowing (Ornstein & Hunkins, 2004).

There are other models of peer tutoring that can be used in the classroom to accomplish a variety of goals. Peer tutors can act as surrogate teachers where they merely transmit knowledge in a linear manner from teacher to tutor to tutee (Topping, 2000). In technology, this strategy may be suitable for instruction that involves new software programs that some students have mastered through previous exposure inside or outside the classroom. This could include web design, digital photography or video editing or instructional software such as Black Board (Coote-Thompson, 2007). The strengths of this strategy are that it:

1. Facilitates more interaction (Topping, 2000).

2. Reduces anxiety (Topping, 2000).

3. Encourages immediate feedback (Topping, 2000).

4. Allows students to take ownership for their learning (Topping, 2000).

Despite these strengths, a peer tutoring approach could send negative messages that some students are technology experts and others are not. To minimize this perception, Potter (2000) suggests that, for technology activities such as introducing new software; one or two children can learn it and then discreetly instruct peers over a period of time. Every child in the class should be allowed to become an expert and teach their peers some aspect of technology for which he or she has developed competence (Potter, 2000).

Assigning pairs from similar social grouping can also be used when the goal is for partners to derive mutual benefit from the relationship. This strategy may be suitable for completion of group projects in social studies and science. The strategy is driven by social constructivism theory (Vygotsky, 1986) and is valued for raising aspirations, rather than deskilling students, as well as fostering relationships, openness and creativity. A possible drawback to using this model is the quality of the tutoring that is provided (Coote-Thompson, 2007).

Classroom management intervention advocates suggest that peer tutoring be used as a strategy to reduce disruptive behavior by assigning disruptive students as peer tutors (Kohn, 1996; Wolfgang, 2005). They argue that teachers sometimes interpret restlessness as a deliberate intent by some students to be difficult. However, they conclude that by channeling students' efforts to activities that place them in decision making roles, their self-esteem will improve and over time they will modify their behavior.

This section outlined a variety of peer tutoring models, their applications in the technology driven classroom, strengths and weaknesses and the underlying theory around which each is based. The next section will discuss how peer tutoring may be combined with technology instruction and integration to yield a variety of learning outcomes.

Peer Tutoring and Technology Instruction and Integration

There is no clear standard of technology integration in K– 12 schools (Bebell, Russell, and O'Dwyer, 2004). There are several characteristics of technology that make peer tutoring an appropriate pedagogical strategy for instruction. The most apparent aspect of appropriateness is the students' differing levels of technological competence. In a 6th grade elementary classroom, there may be students who do not know how to log on to a computer, are unable to launch an internet site, or save a document to the desktop or on a compact disk or flash drive. In that same class, there may be students who have mastered all of these skills plus the ability to perform, after observation or instruction, relatively complex computer functions such as creating presentations, building a website with interactive features, producing, downloading and editing digital images from cameras (Thompson & Bieger, 2006). A peer tutor can form examples and relate to a student on an entirely different level than an adult educator. Assigning these students as tutors and tutees based on their competencies can be effective in improving the progress of individual students.

In a classroom teachers may not be the most competent person in technology. One factor is that these children were born in the technological age. For instance, the class of, 2006 was born in 1988, six years after Apple computers appeared in classrooms and three years after McIntosh computers were introduced (Lengel &

Lengel, 2006). Whether through experience, aptitude or access, these student's competence and attitude towards technology are positive attributes that teachers can capitalize on in their instruction. The formal lines that exist between a teacher and a student are not as defined with someone who is the same age as the person learning, and are therefore easier to cross and find common ground with that said student.

Teachers should be empowered by the fact that no student or technology support personnel can challenge their pedagogical competence. Therefore, instead of seeing technology as threatening to their roles, teachers should examine ways of combining technology with appropriate teaching strategies to maximize student learning. Teachers' willingness and ability to incorporate this approach to instruction is dependent on a variety of factors including:

1. Experience
2. Gender
3. Setting in which they teach and
4. Awareness of cooperative learning strategies with technology instruction and integration to yield greater learning outcomes (Becker, 1994; Briggs, 1998; Cohen, 2002; Cuban, 1986).

The International Society for Technology in Education (ISTE), (2010) show that the Technology Integration Rubric provides a framework for defining and evaluating technology integration, sets a clear vision for effective teaching with technology, gives teachers and administrators a common language for setting goals and helps target professional development resources effectively which is an effective teaching strategy that may be used by teachers to also maximize student learning (see Table 3).

Table 3.
Technology Integration Rubric

Technology Integration Rubric

	Initiating	Developing	Demonstrating
Attitudes	• Teacher is not sure that technology will enhance their teaching or their students' learning, but tries to integrate nonetheless. • Teacher is fearful of change.	• Teacher has some positive experiences with technology and begins to see its potential to enhance their teaching and to enhance student learning. • Teacher occasionally shares practices with other teachers.	• Teacher has had many positive experiences with technology integration. • Teacher is a champion of technology integration. • Teacher frequently shares practices among teachers.
IT Fluency	• Teacher uses technology primarily for presentation or demonstration purposes. • Teacher begins to use technology for interactive student activities. • Teacher uses online access to information from within school. • Teacher uses technology for professional and personal use, such as Microsoft Office software or e-mail.	• Teacher sometimes uses technology for both presentation and interactive student activities (communication, production, collaboration). • Teacher uses online access to information from within school and from home, or from other settings. • Teacher uses technology for personal and professional use, such as MS Office, e-mail, and some Web 2.0 technologies.	• Teacher regularly uses technology for both presentation and interactive student activities (communication, production, collaboration). • Teacher uses online access to information from within school and from home, or from other settings. • Teacher uses technology for personal and professional use such as MS Office, e-mail, and is comfortable with different Web 2.0 technologies.
Planning and Instructional Design	• Teacher is comfortable with the Common Instructional Framework and is starting to plan lessons that have a technology component. • Teacher is somewhat comfortable with the Common Instructional Framework, but has started to plan lessons with technology components.	• Teacher is comfortable with the Common Instructional Framework and has planned some lessons that integrate technology. • Teacher most often chooses technologies appropriate to their activity and need. • Teacher begins to evaluate effectiveness of technology	• Teacher integrates technology seamlessly within the Common Instructional Framework. • Teacher regularly uses technologies to support higher-level learning objectives. • Teacher chooses technologies appropriate to their activity and need. • Teacher encourages students to

Technology Integration Rubric, ©, 2010, Jobs for the Future

Source: Jobs for the Future, 2010. "Assessing Technology Integration." Northwest Educational Technology Consortium. NETC, 2005. Web. <http://www.netc.org/assessing/home/integration.php>.

Although technology has been widely promoted as an effective strategy to transform instruction, there are limitations. Many teachers still do not utilize computers to complement their instruction. Sheeky (2003) observes that many teachers use technology for administrative or research purposes but not as instructional tools. Schools in the United States are being equipped with sophisticated technology. Teachers are accustomed to being knowledgeable about instructional content and may become insecure whenever mastering the use of technology becomes a challenge.

Teachers ought to be encouraged that technology can provide unique learning opportunities for students, as well as themselves. Technology competent students can be paired with students who are less competent (Grabe & Grabe, 2001).

Technology can isolate students from each other. However, when used by a competent teacher, technology can facilitate student interaction (Grabe & Grabe, 2001). Schools should rethink how they integrate technology so that they can better serve students' needs, as well as those of society. Likewise, students should actively work with technology to improve interaction with each other. Education is better when interaction is an integral part of the learning process (Lengel & Lengel, 2006).

A brief overview of peer tutoring and technology instruction/integration has been presented. The section that follows will highlight and discuss pertinent empirical research.

Related Empirical Studies

A number of related research studies have been carried out with relevant findings that strengthen the theoretical base of this study. This section will provide an overview and analyses of these studies and discuss their implications for collaborative approaches to technology instruction and integration.

Feldman, Devin-Sheehan and Allen (1976) were among the first researchers to conduct rigorous, controlled research on peer tutoring. Students with a variety of special needs had benefited from serving as tutors. Children who previously received low scores in reading improved their scores after participating in peer tutoring sessions. Although the effect of peer tutoring on achievement was evident, the impact on students' interpersonal skills was unfounded.

There was also little empirical evidence to show that same-sex pairs were more conducive to peer tutoring than mixed ones. Conversely, pairing students, who were from similar racial and social groupings produced significant improvements in academic achievement (Bloom, 1975; Klaus, 1975; Rosenbaum, 1973). Same-age tutors were as effective as cross-age tutors as relative differential ability was more important than chronological age. Goodlad (1979) found that training tutors, though time consuming, improved their effectiveness. Likewise, there was a positive correlation between structured peer tutoring programs and measured outcomes. When peer-led instruction was compared with teacher-led instruction, peer led instruction could be as effective as teacher led instruction under certain conditions. Tutoring, as a supplement to teaching, proved more effective than teaching only (Gerber & Kauffman, 1981).

This finding is corroborated by a related study that compared qualitative and quantitative outcomes associated with peer tutoring and teacher directed notes in world history for secondary-level students with mild disabilities (Mastropieri, Scruggs, Spencer & Fontana, 2003). A group of sixteen students with mild learning disabilities participated for nine weeks in teacher facilitated and peer tutoring instruction. Over the period, students from both groups were tested using a variety of formats. Students were pre-tested on their content knowledge and comprehension of world history. They were also interviewed on their instructional preferences. Results indicated that students who participated in peer tutoring sessions outperformed students who used guided notes on content area tests. Although results in the oral reading segment did not differ for students who were peer tutored and those who used guided notes, students who participated in peer tutoring reported that the time spent in tutoring sessions made the academic quarter seem shorter (Mastropieri, Scruggs, Spencer & Fontana, 2003).

Teasley (1995) investigated the effectiveness of verbal behavior in fourth graders' peer collaborations in successfully completing a task. Students were paired in a variety of dyads to develop hypotheses to find out how a new mystery key for a spaceship worked. They were also assigned to design experiments to test their hypothesis. Teasley (1995) found that the students who worked with a partner and talked while solving the problem, outperformed the students in the other groups in which students worked with a partner without verbal exchange, worked alone and talked while solving the problem, or worked alone without talking. The outcome of this research suggested that teachers may need to utilize collaborative problem solving activities that involve the use of dialogue between partners. Peer partnerships in technology instruction and integration are used in schools. However, many teachers who favor peer group activities are cautious about dialogue between partners who might use the opportunity to talk about personal matters.

In other related studies, Weinberger, A., Reiserer M., Bernhard, E., Fischer, F., & Mandl, H. (2005) investigated how cooperation scripts can be used to facilitate collaborative knowledge construction in computer-mediated learning environments. Students were required to learn about the attribution theory in different types of computer-mediated environments: discussion board and video-conferencing. Students in the discussion board lab setting were given two types of cooperative scripts; social and epistemic. The social cooperative script was given to encourage conflict related exchanges as well as to reduce the tendency of students to arrive at conclusions, some of which may be false, too quickly. The epistemic cooperative script guided students through the learning tasks. Students' contributions to discussions were initiated by questions or prompts that were displayed in an input window. They were related to problem identification and prediction. The activities of the learners were later determined qualitatively through coding. According to the model of tutor and tutee helping behavior, designed to contribute to the learning of both parties, depicted in Figure 4, learning begins when the tutee starts a new step in a given problem. For the tutee behavior component of the model (the dark-shaded area of the diagram), this model has been adapted for good help-seeking, developed by Aleven, Koedinger, and McLaren (2004). The model encourages tutees to solve problems on their own, but ensures that tutors provide scaffolding when appropriate. In this adaptation of the Aleven, Koedinger, and McLaren (2004) model, tutees can perform two behaviors: trying a step or asking for a hint.

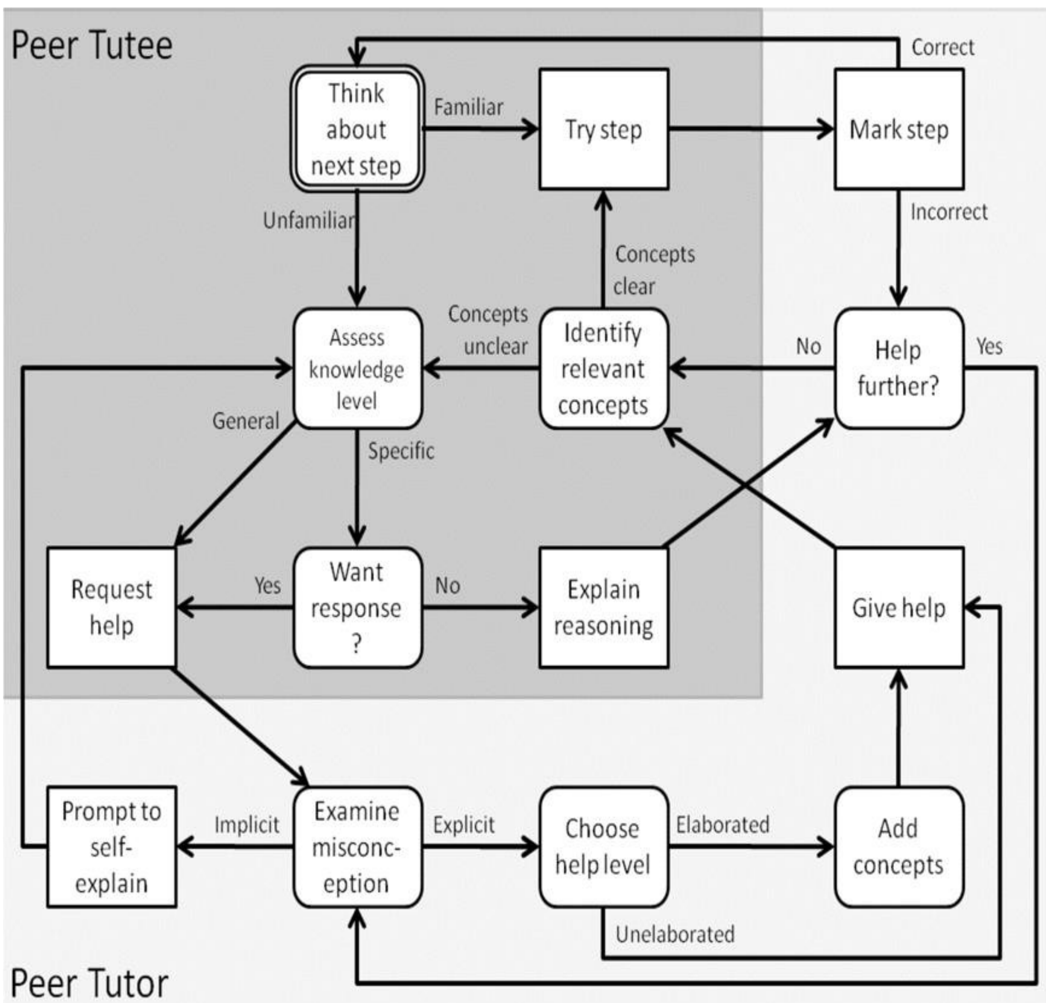

Figure 4. Peer Tutor and Tutee Model.

Source: Aleven, Koedinger, and McLaren (2004).

Tutees should ask for a hint when they begin an unfamiliar step, after they make an error they do not know how to fix, or after they have received a hint they do not know how to use. They should try a step if it is familiar, if they understand the help given to them, or if they understand the error they just made on the step.

Weinberger, A., Reiserer M., Bernhard, E., Fischer, F., & Mandl, H. (2005) study of Collaborative Knowledge Construction showed how cooperation scripts can be used to facilitate collaborative knowledge construction in computer-mediated learning environments, the study concluded that scripts may produce a variety of learning processes and outcomes. The social cooperation script was effective in supporting the conflict-orientation of learners. Likewise the epistemic cooperation script facilitated the application of theoretical concepts during the knowledge construction phase of the interaction. However for learning outcomes, only the social cooperation script fostered individual learning. The epistemic script produced negative effects. That is the learners in this group learned significantly less than those who were assigned to the group in which social cooperation scripts were used as prompts.

A possible cause for this could be that while the epistemic script may have facilitated problem solving during the collaborative phase, it might have inhibited internalization of concepts as evidenced by gaps in learning. Generally, significant processes and outcomes of collaborative knowledge construction may be positively or negatively influenced by cooperation scripts that are pre- programmed into computer-mediated environments (Weinberger et. al., 2005).

Weinberger, A., Reiserer M., Bernhard, E., Fischer, F., & Mandl, H. (2005) study of Collaborative Knowledge Construction showed how important it was as it suggests how educators can guide students' thinking as they participate collaboratively in computer mediated interactions. Collaborative learning works well when the partners possess the ability to help each other to frame and pose questions that solicit responses that are reflective of higher order thinking. Based on the outcome of this research, it would appear that planning and incorporating scripted questions in a computer mediated program is an effective way to ensure that the desired learning outcome is achieved. Usually teachers rely on peers to use their initiative to ensure a cordial learning atmosphere. However, this research suggested that scripts can be used for fostering cooperation as well as the learning of content.

In another research study by the same authors, Weinberger, A. Reiserer M., Bernhard, E., Fischer, F., & Mandl, H. (2005), peer tutoring was done via video-conferencing. The peer tutor interacts with the tutee when she or he needs assistance with learning. The tutors' roles included explaining, providing feedback when requested and posing pertinent questions that allowed the partner to successfully complete the learning task. Weinberger et al. (2005), found that peer teaching through video conferencing was effective when experienced tutors direct tutees through a series of complex learning material. Usually student tutors merely convey information regarding theoretical concepts, since they lack the skills to delve into and provide rich examples for greater understanding. A drawback to this approach though is the over-reliance of collaborative learners on prompts. In using prompts to ensure quality interactions among learners in collaborative computer mediated interactions, educators may consider using prompts at the start of the interaction. When instructors are satisfied with the quality of discussion and learning that takes place, the prompts can be gradually removed and the discussants can be given the opportunity to practice and later develop competence in utilizing collaboration for worthwhile knowledge construction.

Weinberger, A., Reiserer M., Bernhard, E., Fischer, F., & Mandl, H. (2005), also investigated a peer-teaching setting in which the learning partners collaborated also via a video-conferencing system. The researchers investigated how a social cooperation script, an epistemic cooperation script and a combination influenced processes and outcomes of collaborative knowledge construction in a video-conferencing peer-teaching setting. Audio and video-conferencing was set up to facilitate verbal communication and creation of text between assigned tutors and tutees. In the epistemic phase the tutor read a text which described a complex pedagogical theory. The following questions were used as prompts to generate desired responses. What are the most important concepts of the theory? Which pedagogical interventions can be concluded from the theory? (Weinberger, et al A., Reiserer M., Bernhard, E., Fischer, F., & Mandl, H., 2005). In the second or social cooperative learning phase, the pair interacted in four steps: explanation of the text material, supporting leaner's activities, individual elaboration on the text and discussion of main ideas with the partner. The written responses were analyzed and evaluated based on empirical findings that related to the theory and peer tutor and tutees' individual judgment of the theory. The study concluded that learners who used the social cooperative script focused more on theoretical concepts while the peer groups that were supported by the epistemic cooperation script incorporated content from related fields. Learners in the socially scripted setting scored higher than those in the epistemic cooperation scripted setting. (Weinberger, etal A., Reiserer M., Bernhard, E., Fischer, F., & Mandl, H., 2005).

Taylor, L.M., Cato, D.J., & Walls, R.T., (2004) researched to determine the extent to which a technology innovation challenge grant awarded by the US Department of Education was successful in providing teachers with the tools, time and strategies to integrate technology across the curriculum. Using constructivism as the theoretical framework, the authors posited that learner-centered instruction facilitates active engagement and stimulates learning through the use of authentic tasks. Participants received laptops as well as training to assist in constructivist modes of teaching that also made technology an integral part of learning. As part of their training teachers downloaded a unit plan template and developed instructional units which incorporated modifications for students with special needs, enrichment activities and state and national standards.

Taylor et al. (2004) investigated whether there were significant differences in teachers' use of technology following pre - or one year post - training in technology. The researchers also sought to find out whether there were significant differences in pre-training to one-month post-training in classroom observations of interdisciplinary constructivist and technology categories pre-assessment to post-assessment gains for students learning with technology integration versus no integration. The study also explored the level of learning or discovery that students experience as end users of teacher-made unit that integrated technology across the curriculum. The study concluded that technology, rather than being perceived as elective on the curriculum, plays an integral role in learning.

The outcome of Taylor's (2004) study is pertinent to this research which seeks to identify teachers who are most likely to benefit from professional development programs that will equip them to maximize on the usefulness of technology in instruction. Awareness of the benefits of a student - centered approach to technology instruction and integration is the first step to embracing a project that is similar to the type that was developed for teachers who participated in Taylor's (2004) study.

Summary

This section provided an overview of peer tutoring and various peer tutoring models. It also reviewed peer tutoring and technology instruction and integration.

Weinberger, A., Reiserer M., Bernhard, E., Fischer, F., & Mandl, H. (2005) found that successful peer tutoring programs include several other factors besides training. Peer tutoring programs need established goals and objectives, and tutors will need to understand those goals. To conceptualize the information, pertinent literature, theories and empirical studies were also provided. Several studies suggest the most crucial component of a successful peer tutoring program is tutor training.

Descriptions of peer-tutoring and technology-based intervention strategies were provided. In addition, it capitalized on pedagogical principles that can be enhanced through the use of integrated media. Promoting positive attitudes towards peer tutoring in technology instruction and integration is the focus of this research. It is important that technology not be looked at as another school subject. The focus is shifting from teaching computing in a separate class located in a computer lab, to students learning to use the full range of information technology for a purpose as part of the subject area curriculum. Computer technology is a versatile tool that can be utilized effectively with a wide range of academic subjects and instructional strategies. Although digital technologies have become a part of people's everyday lives, teachers still struggle to integrate these technologies into their everyday lessons (Cuban 2005). In order to affect change in teachers' attitudes towards peer tutoring in technology instruction and integration, there must be a change in their value of technology.

This section identified the role of technology in instruction and was used to guide the methodology. This section also focused on the role that technology play in promoting positive attitudes toward peer tutoring in technology instruction and integration. The next section will outline how this research study was carried out and guide educators and policymakers in beginning the process of planning to meet the needs of our children. This study will reveal that teachers' attitudes towards peer tutoring in technology instruction and integration is effective.

Chapter 3

Methods

Introduction

This chapter describes the methods and procedures that were used to investigate the attitudes of teachers towards peer tutoring in technology instruction and integration. The chapter also describes the setting for this research and the procedures for selecting research participants.

The Alabama State Department of Education adopted a technology initiative, IMPACT (2008), which indicates that Alabama's goal of technology fluency for every student necessitates the seamless integration of technology and twenty-first century skills throughout the curricula. The immersion of technology into the curriculum provides an engaging means for students to locate, assemble, and apply relevant information to make connections with essential knowledge. The overarching purpose of IMPACT is to improve learning through the use of technology and provide a framework for the design of local schools and school districts' technology plans for integrating technology across the curriculum. The vision of IMPACT is to leverage the unique powers of technology to provide challenging, stimulating learning opportunities for students throughout the state.

Educational data on students and teachers use of technology in the classroom reported by the U.S. Census Bureau (2001), the National Center for Education Statistics (2012) and the Department of Education (2011) indicates that there is a need for stronger, more effective teaching strategies. The first step in providing positive interactions among students is providing opportunities for them to interact. This means structuring activities and assigning students to groups so that interactions become part of classroom instruction.

Research studies have demonstrated the positive outcome of peer tutoring on student achievement. In-school peer helping relationships have been viewed as a vehicle for diversifying and redefining the role of the classroom instructor, as a response to personnel and resource limitations, and to facilitate learning through the powerful influence of peer relationships (Stenhoff & Lignugaris/Kraft, 2007).

Purpose of the Study

The purpose of this research was to investigate teachers' perceptions of the use of peer tutoring and technology (Bloom, 1975; Goodlad, 1979; Grabe & Grabe, 2001; Klaus, 1975; Lengel & Lengel, 2006; Rosenbaum, 1973; Thompson, 2007). Teacher's attitudes towards peer tutoring in technology instruction and integration in Alabama rural and urban school districts were examined. This research identifies common concerns that teachers experience with students' cognitive processes from developmental to information processing.

The objective of this study was to determine whether or not there was a significant and direct relationship to peer tutoring and student success in the classroom through technology instruction and integration. A survey was proposed to define the contributing factors of teachers' attitudes towards peer tutoring in technology instruction and integration (see Appendix A). Other variables examined were: gender, age, teaching experience, grade level, and teacher's attitudes. This study also developed a profile of teachers who were likely to utilize a direct technology instruction or instruction that involves the use of computers to reinforce learning and to accommodate more collaborative approaches to technology-enhanced instruction as proposed by Coote–Thompson (2007).

Research Questions

For the purpose of this study, the following research questions were examined:

1. Is there a difference between gender and teachers' attitudes towards peer tutoring in technology instruction and integration?
2. Is there a difference between grade level taught and teachers' attitudes towards peer tutoring in technology instruction and integration?
3. Is there a difference between teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
4. What is the relationship of age and gender with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
5. What is the relationship of gender and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
6. What is the relationship between gender and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
7. Is there an interaction between teaching level and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
8. What is the relationship between age and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

Design of the Study

This research study identified the attitudes of teachers towards peer tutors in technology instruction and integration. Teachers' response to an attitudinal survey defined the quantitative components of this research. Quantitative, mainly deductive, methods are ideal for measuring pervasiveness of "known" phenomena and central patterns of association, including inferences of causality (Pasick et al., 2009).

This research was conducted using a modified version of the Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration Survey developed by Dr. Claudette Coote-Thompson (2007). The original design of the survey was influenced by Rosenberg's (1990) theory of the relationship between social property, affective variables and dispositions or behavioral variables (Coote-Thompson, 2007; Rosenberg, 1990). Items for the instrument were developed to assess each of these factors based on the review of literature and various statistical methods that will be described later in this chapter (see Appendix B).

This research study examined teachers who were likely to utilize a pedagogical strategy either for direct technology instruction or instruction that involves the use of computers to reinforce learning by teachers adapting their instruction to accommodate collaborative approaches to technology-enhanced instruction.

The study analyzed data pertaining to the participant's attitudes of peer tutoring, in relationship to specific questions related to the integration of technology in the classroom. Based on the research questions, a quantitative design method was selected. The data collected in the survey included demographic, and quantitative questions which were used to determine the attitudes of teachers towards peer tutoring in technology instruction and integration. Furthermore, using this particular research design allowed for the observance of additional research to show variance in teachers' backgrounds, demographics, and perceptions collaboratively. Interpretation and validation of the data was done throughout the data collection process.

The study examined the attitudes of seventy six, seventh and eighth grade teachers towards peer tutoring in technology instruction and integration. The attitudes of teachers were measured by statements on a survey that were rated on a five-point Likert scale. This research study was conducted to determine the factors that contributed to this group of teachers' use of peer tutoring in technology instruction and integration.

The research may also determine a profile of teachers who are likely to use this pedagogical strategy, peer tutoring, either in direct technology instruction or instruction that involves the use of computers to reinforce learning.

This chapter will provide a description of the methods and procedures that were used to arrive at the findings for this study to investigate the attitudes of teachers towards peer tutoring in technology instruction and integration. This chapter also describes the setting for this research and the procedures for selecting research participants.

Reliability and Validity

This study will attempt to validate the use of this instrument for assessing teachers' attitude toward technology instruction and integration. "Validity refers to the utility of the references made from a measure's scores" (Aginis, Henle & Ostroff, 2001, p. 37). Both reliability and validity refer to the quality of the measurement being examined. Reliability refers to the quality of a test based on the consistency of its measurements. Simply, it's whether a test, or whatever is used as a measurement tool, measures something consistently (Salkind, 2008). The extent to which data collection instruments yield consistent results with minimal error is a demonstration of the concept of reliability (Shannon & Ross, 2008). When data are reliable, there will be a highly consistent result when measures are repeated. The instrument used in this study underwent a validation process beginning with a Q–Sort. The instrument consists of sixteen questions within four domains measuring attitudes of teachers towards peer tutoring in technology instruction and integration. This procedure further validates the survey administered initially in the Coote–Thompson (2007) study. Coote–Thompson (2007) concluded that "since the objective of this aspect of the study was to clarify the questions and gauge how teachers in the target population were likely to respond to the items, there was no threat of this approach affecting the validity of the research findings" (see Appendix C) .

It was assumed that a correlation would exist between age and years of experience to the scores on the instrument. With both age and experience the individual is likely to have successfully integrated technology in instruction and will have developed skills and confidence, which will leave them better prepared to successfully manage similar peer tutoring strategies in technology instruction and integration learning endeavors.

Instrumentation

In a conversation with Coote-Thompson (2011), (see Appendix C) concerning the validity of the survey, she indicated that Rosenberg's (1990) theory was used to explore relationships among social property, affective variables, and dispositions or behavioral variables. For example, older teachers would represent a social category, their resistance to reveal their discomfort with technology is dispositional, internal characteristic(s) that reside within an individual, which is, in this case, based on their use or exposure to technology. Rosenberg's (1990) theory on behavior helped to determine that teachers' attitude towards the integration of technology in the classroom is behavioral and for this study the researcher conducted a Q–sort for clarity and readability of the survey questions.

For this study, one qualitative question was added, "What do you see as the disadvantages of peer tutoring in technology instruction and integration?" for a total of three open–ended questions. Two of the original quantitative questions were deleted, "I do not teach computer technology but I integrate it in my instruction" and "I teach computer technology and integrate it into my instruction". The following questions replaced them, "I integrate computer applications/technology in my instruction", "Have you ever used peer tutoring?", "Peer tutoring is effective in technology instruction and integration" and "Students are more engaged when they share what they know". As a result of the Q–Sort, these questions improved the clarity and readability of the questions. These five questions assisted in validating the use of the survey instrument for assessing teachers' attitudes towards peer tutoring in technology instruction and integration.

The instrument was developed to assess attitudes of teachers towards peer tutoring in technology instruction and integration. The following sequence of actions outlines the process of developing the instrument into the format used in this study:

1. Research Questions - The questions, which are answered by the instrument, were re-designed to represent the four domains that contribute to attitudes of teachers towards peer tutoring in technology instruction and integration. The target population consisted of teachers from diverse educational backgrounds,

ranging from those with a bachelors' degree to those having graduate level degrees, teaching in various subject areas.

2. Q- Sort Validation - The Confirmation Panel conducted a Q-sort analysis of the instrument questions related to the four domains.

3. Field Test - A field test of the instrument was conducted at a middle school in southeastern Alabama. Information obtained in this field test was used to evaluate and correct the instrument for clarity and conciseness before distributing the survey to the larger teacher population.

Q-Sort Panel

A panel of experts was formed from ten faculty members at a middle school, in southeast Alabama. The members of this panel were recruited because of their extensive experience with evaluating and educating sixth, seventh, and eighth grade students. These educators were chosen from various subject areas, and they either taught technology or integrated it in their lessons. The purpose of this panel was to aid in evaluating the instrument and for strengthening validity prior to field testing.

The ten teachers who were selected from the Confirmation Panel were seven females and three males with between five to twenty years of teaching experience in various subject areas with one teacher that taught a Computer Applications class. They also varied in their use of technology in instruction. Nine of them integrate technology into their instruction and one of them teaches technology as an independent subject.

Q-Sort Method

The Q-Sort method was developed by Stephenson (1953) and it was quickly adopted into Client Centered Therapy by Carl Rogers (1961), which measures congruence between the ideal and true self. The Q–Sort is a self-assessment procedure for measuring congruence, is a state of internal consistency, which requires subjects to sort items relative to one another along a dimension such as "agree" or "disagree" for analysis by Q-methodological statistics (Rogers, 1961). For this study, the Q–Sort Method consisted of briefly defining the four domains and recording this information on four individual strips of paper. Participants were asked to read the directions, and complete the Q-Sort (see Appendix D). The following definitions were provided for clarity:

- Technology Instruction refers to the teaching of computer applications as a subject.
- Technology Integration refers to the use of computer technology to enhance the teaching of any K-12 lesson in all subjects including Language Arts, Mathematics, Science and Social Studies.

Definition of domains:

1. Peer Tutoring is a process by which a student with minimal training and with a teacher's guide helps one or more students at the same grade level to learn a skill or concept.
2. Student Technology Skills Students' with experience using a computer, e.g., start, restart and shutdown a computer, handles disks and computer with respect, demonstrates acceptable behavior at the computer and in the lab.
3. Student Competence Students' ability to recognize when information is needed and to locate, evaluate and use that information effectively.
4. Student Collaboration The assistance that learners require may be provided by experts such as teachers and by peers, who collectively have expertise distributed among them. When students work together they learn from one

another and extend their interaction and learning outside of the classroom.

Materials:

1. Envelope
2. 3 Paper clips
3. 3 strips of paper with the domains for the survey printed on them, numbered 1-4.
4. 16 strips of paper with the survey questions printed on them, numbered 11-26.

Each sentence was individually recorded onto slips of paper. The domains were developed from the research questions. The domains were determined based on the survey developed by Coote-Thompson (2007). Each of the members of the selected expert confirmation panel were given a set of Q-sort materials which included the four domains and sentences, and were asked to place each sentence under the appropriate domain.

Teachers were provided with an envelope and inside were instructions as to how to execute the question sort (Q-Sort). Teachers were directed to locate the four domains and sixteen sentences on slips of paper. They were then instructed to take each domain and place them, preferably, on a table in front of them. They were then asked to take the sixteen statements and place them with the related domains. Once they were done, they were to take the domains and the questions they had chosen to go with that particular domain and paperclip them together. Once they had done this, they were to place each one in the envelope provided to them, and return them.

Pilot Testing

Prior to administering the survey to the selected sample for this study, a pilot study was conducted to test the content validity of the instrument. This step was necessary since the survey instrument was specifically modified for this study.

Instruments that had been used before do not require pilot testing (Coote-Thompson, 2007; Punch, 2003). Numerous attitude surveys exists; however, they were not appropriate for this research which examined the attitudes of teachers towards a specific pedagogical approach to technology instruction and integration (Coote-Thompson, 2007). The original design of the survey was influenced by Rosenberg's (1990) theory of the relationship between social property, affective variables and dispositions or behavioral variables (Rosenberg, 1990; Coote-Thompson, 2007).

The survey was modified based on the Q-sort, to remove the two unclear items in the Student Competence and Student Technology Skills domain groups. Field testing of the instrument was conducted at a middle school in southeastern Alabama. This sample is smaller than the main population to be surveyed, but maybe representative of the larger population. Observations and inferences made during the field test can be applicable to the larger population of the teacher population to be surveyed (Rosenberg, 1990).

Results of the sorting conducted by each of the panel members were analyzed to determine accuracy and any corrections to the wording of items to improve accuracy in subsequent Q-sort exercises. During the initial Q-sort evaluation it was determined that two of the four major factors, Peer Tutoring, Student Technology Skills, Student Competence and Student Collaboration, exhibited a considerable overlap. These two factors were Student Technology Skills and Student Competence. Attempts at rewriting the instrument items in these two domains for increased clarity did not eliminate the overlap. Review of the literature for these two factors also indicated a large amount of overlap. Student Competence is identified by many authors as a major factor in Student Technology Skills (Bitter & Pierson, 2005). It was determined that the factors, Student Competence and Student Technology Skills, should be merged into one group, with the overlapping survey items consolidated. Subsequent Q-sorts guided the consolidation of the original sixteen items in these two groups into fifteen statements on the survey and three domains. The Q-sort process was repeated, using the same confirmation panel, until an accuracy of 99.9% was observed on the results of all panel members. Subsequently, the final format of the survey was produced and field tested, for clarity and readability.

The confirmation panel was used for the purpose of the survey pilot test, and represented the composition of the teachers who would be surveyed in the target population. The pilot study included Alabama public school teachers who teach different grade levels and subjects, those who integrate technology in their instruction and those who teach technology as an independent subject. These Alabama public school teachers also represented varying ages, from age twenty–one through age fifty and ethnicities ranging from Caucasians, African American and Asian.

Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. Alpha was developed by Lee Cronbach in 1951, to provide a measure of the internal consistency of a test or scale; it is expressed as a number between 0 and 1. Internal consistency describes the extent to which all the items in a test measure the same concept or construct and hence it is connected to the inter-relatedness of the items within the test. Internal consistency should be determined before a test can be employed for research or examination purposes to ensure validity. If the items in a test are correlated to each other, the value of alpha is increased. However, a high coefficient alpha does not always mean a high degree of internal consistency. This is because alpha is also affected by the length of the test. If the test length is too short, the value of alpha is reduced. Thus, to increase alpha, more related items testing the same concept should be added to the test. It is also important to note that alpha is a property of the scores on a test from a specific sample of tests. Therefore investigators should not rely on published alpha estimates and should measure alpha each time the test is administered. Results of the Cronbach's alpha data analysis using SPSS (Statistical Package for the Social Sciences), indicated that all three factor domains showed validity with a coefficient alpha at or near a level of .50. The peer tutoring factor was at .42, the student competence factor was at .50, and the student collaboration factor was at .44. The final format of the instrument included five statements representing student collaboration. The combined alpha coefficient for the three items is $\alpha = 0.44$, suggesting that the items have internal consistency, for instance, a reliability coefficient of 0.50 or higher is considered acceptable in most attitude research studies. The final format of the survey based on the Q-Sort which included five items representing the domain of peer tutoring, five items for student competence, and five items representing student collaboration. The process of Q-sort was repeated until an accuracy of 100% was observed on the results of all panel members.

The resulting fifteen items are listed below in their respective domains in groups of five:

Peer Tutoring

1. Peer tutoring can help students to improve their technology skills.
2. The benefits of peer tutoring in technology instruction/integration outweigh the inconveniences.
3. Peer tutoring in technology instruction/integration takes away teachers responsibility for instruction.

4. Peer tutoring is ineffective in technology instruction and Integration.

5. Peer tutoring is effective in technology instruction and Integration.

Student Competence

1. In a class the teacher might not be the most competent person in technology.

2. Only competent students should be assigned as peer tutors.

3. Student's competence in technology should be recognized.

4. I capitalize on students' technology competence.

5. Students who are technology competent are intimidating.

Student Collaboration

1. Students work better when assisting other students.

2. Students should collaborate only on difficult technology assignments.

3. Students should learn to teach each other technology skills because that's how it is in the workplace.

4. Computer classes are better when students are allowed to work in pairs.

5. Students are more engaged when they share what they know.

Since the objective of the confirmation panel was to clarify the questions and gauge how teachers in the target population were likely to respond to the items on the survey, there was no threat of this approach affecting the validity of the research findings. Age, gender, ethnicity, teaching experience and teaching level are variables that were investigated as part of this study. The feedback from the pilot study was used to refine the survey.

Methods

Teachers (N=145) from selected schools completed a 28 item survey and it included a demographics section. To guarantee a high survey response and return rates, teachers were asked to complete the surveys during a professional development workshop. Prior to administering the survey, the superintendents of the districts and principals of the individual schools provided authorization to conduct this research and for teachers to complete the survey (see Appendix E).Administering surveys to schools within Southeastern Alabama school districts, both rural and urban, was ideal for this study as it increased the chances of a diverse group of teacher respondents. Teachers in the selected school districts taught students of varying ages. The teachers also varied in the number of years that they have taught and possessed different attitudes towards peer tutoring in technology instruction and integration.

The statements on the survey addressed teachers' attitudes towards peer technology instruction and integration, and towards acknowledging competence of students to be technology peer tutors. Teachers were asked whether they taught technology as an independent subject, integrated it into their instruction, or have ever used peer tutors across all subject areas. The survey was also used to collect data on demographic characteristics such as gender, age, ethnicity, teaching experience and the grade level that they teach. Responses were ranked on a five point Likert scale with five representing Do Not Know, four representing Strongly Disagree, three representing Disagree, two representing Agree and one representing Strongly Agree. Participant surveys were coded using an identification number to ensure confidentiality (see Appendix F). Only teachers who taught sixth through eighth grade public school students participated in this research as the results were intended to influence pedagogical instructional approaches to technology instruction and integration in publicly funded schools. The 6^{th}, 7^{th}, and 8^{th} grade year students were chosen for this study because these years are critical in a child's development. This group has the opportunity to explore their talents and develop the skills necessary to succeed in high school and beyond. Peer tutoring in technology instruction and integration can provide students with the supportive environment they need to successfully make the transition to high school and eventually college and the world of work.

Population and Sample

The sampling was conducted using the revised survey. The researcher provided an explanation of the purpose of the study, as well as instructions for completing and returning the survey instrument which were distributed at faculty meetings in the various school districts (see Appendix G). Participants were recruited on a voluntary basis from middle schools in the southeastern region of the state of Alabama (see Appendix H). Three hundred surveys were initially distributed at faculty meetings in the various school districts, to a group of teachers who taught sixth, seventh or eighth graders in various teaching fields. These school districts were selected as their responses would reflect diverse views from urban and rural school settings in southeastern Alabama which allowed me to develop a representative picture of the attitudes and characteristics of both small and somewhat larger populations of teachers.

To obtain a significant number of responses in this study the minimum number of surveys to be collected was set at 100, with the maximum number to be collected set at 300, from sixth through eighth grade teachers from urban and rural school settings in southeastern Alabama. During the research process, a total of 145 completed surveys were returned which represents a return rate of 48 percent. Of the 145 surveys completed by participants, and for the purpose of the research, 76 were conclusively used for data analysis as these participants completed all of the questions on the survey. Sixty-nine surveys were eliminated from analysis due to incomplete surveys by the participants. Survey respondents ranged in age from 21 – 60 years of age. This age range was beneficial in order to investigate whether there was a relationship between teachers' age as well as their length of service or experience in the profession and their attitudes towards using peer tutoring in instruction and integration. The participants included individuals from both genders, since gender was one of the independent variables that were investigated in this research. Teachers were given the opportunity to opt out, without any risk or harm. There were no rewards provided for participation in this study. The teachers were receptive to the Principal Investigator (PI). All who participated were willing participants in the data collection process. The Superintendents and Principals of each school district were accommodating and open to the data collection process.

Data was gathered over a period of one year beginning with the development of the survey statements, and two Q–Sorts revisions based on results of the Q–Sorts, and a confirmation panel. The survey was refined and the revised survey was administered, and collected. In an effort to avoid coercion, school administrators were previously asked to leave the classroom while teachers completed the surveys. The administrators and teachers were accommodating, and open to the data collection process.

The Principal Investigator utilized the following steps in gathering data:

1. Upon completing all requirements of Auburn University's Institutional Review Board (IRB) (Appendix H), including Collaborative Institutional Training

Initiative (CITI) training (Appendix I), and receiving approval from the IRB, the Principal Investigator (PI) contacted, via telephone, e-mail, and/or in person the administrators of each school inclusive of the research prior to arriving to collect data.

2. The PI was granted permission, by the administrators via e - mail and/or acknowledgement of receipt of Site Authorization Letter (Appendix J), to recruit teachers for the purpose of this study.

3. The PI contacted, via e-mail and/or telephone, the administrators from each of the 4 schools in their prospective districts to verify a date and time of arrival prior to survey administration.

5. The Principals of each district gave a brief introduction to the teachers as to what was about to take place, and then left the room.

6. After the Administrator left the room, the PI read the Recruitment Script verbatim.

Feedback from the surveys were limited as some teacher's had not completed surveys within an allotted time and wanted to return them at a later date. As a result, teacher' s were given an extension of one week with survey to be collected by the department heads and returned to the administrator to be returned to the PI. Follow-ups were to be conducted by the PI with each principal, for collection of surveys.

Survey results were analyzed by first entering demographic data and questionnaire responses into Microsoft EXCEL to create a data dictionary for data analysis. After the data entry process was complete, data were analyzed using Statistical Package for the Social Sciences (SPSS, version 21for Windows). SPSS is an easy-to- use data editor that allows the user to, according to Green and Salkind (2008), "select items from a drop-down menu to make appropriate transformation of variables; click options from another menu to create graphs of distributions of variables; select among various statistical analyses by clicking on appropriate options, and more" (p. xi).

The Statistical Package for the Social Sciences (SPSS) was used to conduct four types of analyses of the study data. First, a reliability analysis was conducted using Cronbach's alpha coefficient. Descriptive statistics were computed on the data from the Attitude Questionnaire (Coote–Thompson, 2007). These included the calculation of frequencies and percentages of observations that make up each one of the categories for that variable (see Appendix K). Summary statistics were also calculated for behavioral subscales, which is basically an item response analysis which, in this study, it is based on the survey.

The final data for this research was completed on March 15, 2013. The Mixed Method process was selected as the research method to use for this study because it analyzed both quantitative and qualitative data. The researcher used a partially mixed method in which quantitative research was used for the first phase of the study and qualitative for the second phase. This was done to corroborate, complement, explain paradoxes and contradictions, as well as to expand the scope of the study. The mixed method approach is consistent with Johnson and Christensen's (2004) thinking that collecting multiple sets of data in educational research helps to improve the validity of the study, since both methods have varying strengths and weaknesses. Quantitative research, while being useful in testing hypotheses and making generalizations about populations, does not explore participants' perspectives. Conversely, qualitative research produces rich, in-depth information about participants' views as well as possible explanations for phenomena (Johnson & Christensen, 2004).

In this research study, the quantitative data that was collected from the participants and its analysis was useful in predicting and identifying relationships between variables. For example, the interaction of teaching experience and teaching level will have an effect on teachers' perception of the statement "In a class the most competent person in technology might not be the teacher". However, this technique did not offer explanations for these relationships (Coote–Thompson, 2007).

Data Analysis

Based on review of the literature some factors including gender, age, race, teaching experience and teaching level may influence teachers' attitudes towards a peer tutoring approach to technology instruction and integration. To examine whether, or to what extent to which these factors affect teachers' attitudes towards a peer tutoring approach to technology instruction and integration, the statistical analyses of Independent Samples T-test, One-way and Two-Way ANOVA were applied.

Independent Samples T -test were used to respond to the research questions that examined the differences between the means of two independent groups with regards to their attitudes towards peer tutoring in technology instruction and integration. The independent groups, gender (male and female), and technology instructor and integrator were examined in this study.

A One-Way ANOVA was used to analyze the independent variables with more than two levels. Specifically, a One-Way ANOVA was applied in this research to examine whether age, grade level taught and teaching experience played significant roles in teachers' attitudes towards a peer tutoring approach to technology instruction and integration. These independent variables were divided into sub-categories. For example teachers who completed the survey fell into one of four age groups: 21-30, 31- 40, 41-50 and over 50. The teachers also taught various grade levels. For statistical analysis, the grade levels examined were 6^{th}, 7^{th}, and 8^{th} grades. Teachers who volunteered to complete the survey taught between one to over 20 years. Therefore the variable, years of experience was subdivided into five groups; 0-5 years, 6-l0 years, 11-15 years, 16-20 years, and over 20 years. The groups were recoded into two or three subdivisions to facilitate One-Way ANOVA tests.

Post Hoc Tests were conducted to investigate differences between sub-groups. For this research, teachers in four age categories, three grade levels and five teaching level sub-categories completed the survey. Based on these demographic characteristics a One-way ANOVA was applied to analyze the significance of the means of these variables. For this test an F ratio is compared with the accepted value of 0.05.

This research also investigated whether there was an interaction between independent variables and the influence on teachers' attitudes towards a peer tutoring approach to technology instruction and integration. The interacting variables that were examined in this research are: age and gender, gender and grade level taught, and years of experience and grade level taught. For this analysis, a Two-Way ANOVA was used to investigate the effects of various pairs of interacting variables on teachers' attitudes towards a peer tutoring approach to technology instruction and integration.

Open-Ended Responses

There were three open-ended questions used in the survey: “What are your concerns about peer tutoring in technology instruction and integration?” and “What do you see as the advantages of peer tutoring in technology instruction and integration?” and “What do you see as the disadvantages of peer tutoring in technology instructions and integration?" The analysis entailed creating a three row table and recording the narrative responses of teachers to each question. The responses will be used to investigate teachers' attitudes towards a peer tutoring approach to technology instruction and integration.

Confirmatory factor analysis was performed on the data using AMOS version 21.Secondary analysis of the research questions was conducted using SPSS, version 21. Results from the study are provided in Chapter four.

Summary

The creation of the instrument items involved a Q-sort process which ultimately led to the final version of the survey that was to be administered to teachers. The initial survey created by Dr. Claudette Coote-Thompson (2007), consisted of eighteen initial items, representing the factors - Peer Tutoring, Technology Instruction, and Technology Integration. Technology Instruction and Technology Integration was removed and Student Competence and Student Collaboration were added after an analysis of the field test data. Ultimately, this process identified the need to consolidate two highly related domains, Student Technology Skills and Student Competence into one composite domain, Student Competence.

This chapter described the methods that were used to select participants for this study. The section also provided a description of how the data from this research were collected, collated and analyzed. The next chapter will highlight the results obtained from applying these techniques to investigating the attitudes of teachers towards peer tutoring in technology instruction and integration.

Chapter 4

Findings

The purpose of this research was to investigate teachers' perceptions of the use of peer tutoring and technology. Teacher's attitudes towards peer tutoring in technology instruction and integration in Alabama rural and urban school districts were examined. For the purpose of this study, the following research questions were examined:

1. Is there a difference between gender and teachers' attitudes towards peer tutoring in technology instruction and integration?
2. Is there a difference between grade level taught and teachers' attitudes towards peer tutoring in technology instruction and integration?
3. Is there a difference between teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
4. What is the relationship of age and gender with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
5. What is the relationship of gender and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
6. What is the relationship between gender and teaching experience with regards to teachers' attitudes towards peer tutoring in technology

instruction and integration?

7. Is there an interaction between teaching level and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
8. What is the relationship between age and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

The results of data collection and analysis will be presented in this chapter. The quantitative section will describe the sample that was used in this research. The chapter will also outline the descriptive statistics for dependent and independent variables that were investigated in this study. The chapter will also present results that were obtained from the testing procedures: Independent Samples T-test, One-way and Two-way Analysis of Variance (ANOVA). Independent Samples T-test were used to determine whether there were differences between selected independent variables with regard to specific statements that indicated teachers' attitudes towards peer tutoring in technology instruction and integration. ANOVA tests were used to compare the means between independent samples with regard to peer tutoring in technology instruction and integration.

Participants

The participants in this study were 76 teachers from four school systems in Central and Southeast Alabama. A total of 300 surveys were distributed to full-time public school sixth through eighth grade teachers in four school systems. Of this number, 145 teachers returned surveys representing a return rate of 48 percent. Of the 145 surveys, 76 were conclusively used for analysis. While preparing data collection spreadsheets for analysis, 69 were eliminated from analysis due to incompletion by the survey participant. A total of 76 surveys were ultimately used for analysis.

Demographic Information

The sample was comprised of teachers with varying demographic profiles including gender and age. This data is presented in Table 4. Of the total sample of 76, most of the teachers were male (51.3%), and 44.8% were within the 41-50 years of age category. The age category, 31-40, represented the second highest percentage (30.2%) of teachers who completed the survey. The number of teachers in the two age groups, 21 to 30 (n=13) and Over 50 (n=6) differed by only 9.2%.

Table 4

Teacher Characteristics

Characteristic		Frequency	Percentage
Gender			
	Male	39	51.3
	Female	37	48.7
Ethnicity			
	Caucasian	34	44.7
	African American	17	22.4
	Asian	7	9.2
	Hispanic	7	9.2
	Other	11	14.5
Age			
	21-30	13	17.1
	31-40	23	30.2
	41-50	34	44.8
	Over 50	6	7.9

Table 5 demonstrates the reliability of the survey used to examine the attitudes of teachers towards peer tutoring in technology instruction and integration. The reliability of domain 1, Peer Tutoring was established by a Cronbach's alpha = 0.42, Domain 2, Student Competence with a Cronbach's alpha = 0.50 and Domain 3, Student Collaboration with a Cronbach's alpha = 0.44. Cronbach's alpha for each domain scale was at or near $\alpha = 0.50$. The alpha coefficient for each of the three domains suggest that the items have internal consistency, for instance, a reliability coefficient of 0.50 or higher is considered acceptable in most attitude research studies.

Table 5

Reliability Statistics: Cronbach's Alpha for Factors 1, 2 and 3

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.458	.507	15

The case processing summary of the Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration survey was administered and an accuracy of 100% was observed as illustrated in Table 6.

Table 6

Validity: Case Processing Summary

		N	%
Cases	Valid	75	98.7
	Excluded[a]	1	1.3
	Total	76	100.0

a. Listwise deletion based on all variables in the procedure.

Teaching Experience and Teaching Levels

The teachers also varied in their teaching experience, the levels at which they teach, how they use technology in their classrooms, and how often they use peer tutoring. Teachers who completed the surveys were asked whether they taught technology as an independent subject or integrated technology into their instruction. Table 7 shows that most of the teachers (n=36) or (47.3%) have 6 to 10 years of teaching experience, with the highest proportion (57.9%) of them teaching 8th grade. This is significantly higher than the proportion of teachers (14.5%) who reported that they taught 6th grade.

Table 8 shows the overall, the mean age of the predominately male sample is 40 plus years of age with a mean teaching experience of 6 to 10 years. The majority of the teachers who were surveyed taught 8th grade. The number of teachers who integrate technology into their instruction (100%) is significantly higher than those who teach computer technology as an independent subject (21.1%).

Table 7

Teaching Experience, Teaching Levels and Technology Use

Characteristic	Frequency	Percent
Years of Teaching		
0-5	13	17.1
6-10	36	47.4
11-15	22	28.9
16-20	4	5.3
Over 20	1	1.3
Teaching Level		
6th	11	14.9
7th	21	27
8th	44	58.1
Technology Use		
Teach as an ndependent Subject	16	21.1
Integrate into Instruction	76	100

[a]16 of the 76 respondents also teach technology as an Independent Subject. Participants that teach technology as an Independent Subject also indicated that they integrated technology use into instruction.

Table 8

Distribution of Sample based on Teacher Demographics

Characteristic	M	SD
Gender	1.49	0.503
Age	41.17	7.703
Ethnicity	2.45	1.872
Years of Teaching	9.87	4.349
Teaching Level	2.43	0.736
Teach and integrate	1.00	0.000
Teach computer technology	1.79	0.410

N=76

Responses of Teachers to Selected Dependent Variables

This research study examined the attitudes of teachers towards peer tutoring in technology instruction and integration. Research questions pertaining to teachers' attitudes were used to gauge their perception of this approach to technology instruction and integration.

Table 9 describes how teachers who were surveyed responded to the variable "peer tutoring can help students to improve their computer technology skills." The mean response for each demographic was 1.49. The survey for this research used a five - point Likert Scale where 1 represented Strongly Agree; 2 denoted Agree; 3 meant Disagree; 4 was interpreted as, Strongly Disagree and 5 represented Do Not Know Therefore, a low mean score represents strong agreement with the statement (Appendix A). The response to the variable, "peer tutoring can help students improve their technology skills" is constant when years of teaching are within the 16-20 and Over 20 age categories. Teachers from this sample, regardless of their gender, age, teaching experience and teaching level, agree that peer tutoring can help students to improve their computer technology skills.

Table 9

Descriptive Statistics: Peer Tutoring can help students Improve their Technology Skills

Characteristic	N	M	SD
Gender			
Male	39	1.49	.506
Female	37	1.45	.559
Age			
21-30	13	1.38	.539
31-40	23	1.45	.594
41-50	34	1.40	.516
Over 50	6	2.22	.500
Years of Teaching			
0-5	13	1.63	0.60
6-10	36	1.37	.551
11-15	22	1.43	.537
16-20	4	constant	constant
Over 20	1	constant	constant
Teaching Level			
6th	11	1.27	467
7th	21	1.67	.577
8th	44	1.45	.504

Table 10 reveals that teachers of all age categories tend to capitalize on students' technology skills.

Table 10

Descriptive Statistics: I Capitalize on Students' Technology Skills

Characteristic	N	M	SD
Age			
21-30	13	2.40	1.10
31-40	23	2.10	0.80
41-50	34	2.06	0.64
Over 50	6	2.25	0.50

As shown in Table 11, teachers in all age categories disagree with the statement, computer classes are better when students work individually. However, teachers in the 31-40 age category reported stronger disagreement (Mean=4.18). With regard to the benefits of students working in pairs on technology- related assignments, teachers in the over 50 age group are less likely to engage in this practice. This was revealed in their disagreement (Mean score 2.50) with the statement "computer classes are better when students work in pairs." As defined in Table 12, the mean score for teachers in the other age categories ranged from 1.54 to 2.04. Overall these groups are amenable to students working in pairs during technology instruction and integration.

Table 11

Descriptive Statistics: Computer Classes are Better When Students Work Individually

Characteristic	N	M	SD
Age			
21-30	13	3.67	0.58
31-40	23	4.18	3.17
41-50	34	2.87	0.48
Over 50	6	constant	constant

Table 12 shows teachers with 16-20 years of teaching experience did not favor peer tutoring teaching strategies in technology and integration. The mean response for the category was 2.50 (Table 12) on a five - point likert scale where 1 represented strongly agree; 2-agree; 3-disagree, 4 denoted strongly disagree and 5 meant do not know. Teachers with 6- 10 years of teaching experience agreed that pairing students works well for technology- related activities. The mean score for this category was 1.67.

Table 12

Descriptive Statistics: Computer Classes are better when Students work in Pairs

Characteristic	N	M	SD
Age			
21-30	13	2.04	0.54
31-40	23	1.54	0.57
41-50	34	1.62	0.65
Over 50	6	2.50	1.73
Years of Teaching			
0-5	13	1.93	0.58
6-10	36	1.67	0.68
11-15	22	1.68	0.56
16-20	4	2.50	1.73
Over 20	1	2.00	0.00

Teachers regardless of gender, age and teaching level agreed that teachers might not be the most technologically competent person in the classroom (see Table 13). The mean response for all categories of teachers who completed the survey was (1.92). The relatively small standard deviation (0.54-1.26) indicated very little dispersion of the responses of teachers in the various categories.

Table 13

Descriptive Statistics: In a Class the Teacher might not be the Most Competent Person in Technology

Characteristic	N	M	SD
Gender			
Male	39	2.03	0.67
Female	37	1.81	0.62
Age			
21-30	13	1.54	0.54
31-40	23	1.93	0.76
41-50	34	1.83	0.61
Over 50	6	2.25	1.26
Teaching Level			
6th	11	2.18	0.60
7th	21	1.86	0.66
8th	44	1.89	0.66

Results of Independent Samples T-test

An Independent Samples T-test was done to determine whether there was a difference between gender and teachers' attitude with regard to teachers' belief that the benefits of peer tutoring outweigh the inconveniences. Tests were run to investigate whether there was a significant difference between the attitudes of males and females with regard to the dependent variable "the benefits of peer tutoring outweigh the inconveniences."

The data shown in Table 14 indicated that there was no significant difference between male and female teachers' attitudes with regard to the variable, "the benefits of peer tutoring outweigh the inconveniences." The derived p value of 0.23 was greater than the accepted alpha level of 0.05. Therefore, there is no difference between the attitudes of female teachers with regard to the statement that the benefits of peer tutoring outweigh the inconveniences.

Table 14

Independent Samples T-test for Gender

Characteristic	N	M	SD	t
Gender				
Male	39	2.03	0.49	1.19
Female	37	1.86	0.67	

$P=0.23 \geq 0.05$

Tests for significance (see Table 15) were also run to determine the observed level of significance between teachers who teach computer application as independent subject and those who integrate it into their instruction with regard to the dependent variable "students' technology skills should be recognized." One hundred percent of teachers surveyed agreed that they integrate technology into their instruction. No statistics could be computed due to the equality of the variable, "I integrate technology into my instruction." For teachers who teach computer applications as an independent subject, a p value of 0.59 was computed which is higher than the accepted alpha level (0.05). This suggests that, for this sample, teachers who teach computer applications agree that students' technology skills should be recognized.

Table 15

Independent Samples T-test: Summary Table for Use of Technology

Characteristic	N	M	SD	t
Use of Technology				
Teach Computer App.	76	1.79	.41	-0.57

$P=0.59 \geq 0.05$

Results of One-Way ANOVA Analyses

Another hypothesis testing procedure, One-Way ANOVA, was used to determine differences among teachers in different age groups, with varied teaching experience as well as those who taught different grades with regard to their attitudes towards peer tutoring in technology instruction and integration as shown in Table 16. The dependent variable "Peer tutoring is ineffective in technology instruction and integration" was used.

Table 16

Descriptive Statistics: Peer tutoring is Ineffective in Technology Instruction and Integration

Characteristic	N	M	SD
Age			
21-30	13	3.23	0.77
31-40	23	3.19	0.75
41-50	34	3.15	0.66
Over 50	6	2.75	0.55

A One-Way ANOVA test was done to investigate whether age group was a factor in teachers' perception of the variable "peer tutoring is ineffective in technology instruction and integration" (See table 17). The significantly high probability value (0.339) indicates that there is no difference among teachers of various age groups with regard to their reaction to the statement "Peer tutoring is ineffective in technology instruction and integration."

Table 17

Results of ANOVA Tests: Peer tutoring is Ineffective in Technology Instruction and Integration

	Sum of Squares	df	Mean Square	F	Probability
Between Groups	9.702	17	.571	1.143	.339
Within Groups	28.969	58	.499		
Total	38.671	75			

A One-Way ANOVA test was performed to determine whether there were significant differences among the teachers who taught different grade levels with regard to the dependent variable "the benefits of peer tutoring outweigh the inconveniences" (See Table 18 and Table 19).

Descriptive Statistics

Table 18

Descriptive Statistics: The Benefits of Peer Tutoring Outweigh the Inconveniences

Characteristics	N	M	SD
Teaching Level			
6th	11	1.82	0.60
7th	21	1.95	0.59

8th	44	1.98	0.59

Table 19 shows the results show a probability level of 0.728, which is significantly higher than the accepted alpha level (α) of 0.05. Therefore, there is no significant difference among the teachers who teach 6th, 7th, and 8th grade levels and their agreement or disagreement to the statement “the benefits of peer tutoring in technology instruction and integration outweigh the inconveniences.”

Table 19

Results of ANOVA Tests: The Benefits of Peer Tutoring in Technology Instruction/Integration outweigh the inconveniences

	Sum of Squares	df	Mean Square	F	Probability
Between Groups	.223	2	.112	.319	.728
Within Groups	25.566	73	.350		
Total	25.789	75			

A One-Way ANOVA test was performed to investigate whether there were differences among teachers with varying teaching experience with regard to their beliefs that peer tutoring is ineffective in technology instruction and integration. The small probability ratio (F=0.893) indicates similarity in means. Correspondingly, the calculated probability value of 0.414 is significantly larger than the accepted alpha level (α=0.05). Therefore, teaching experience has no effect on teachers’ belief that peer tutoring in technology instruction and integration is ineffective (see Table 20 and 21).

Table 20

Descriptive Statistics: Peer Tutoring is Ineffective in Technology Instruction and Integration

Characteristic	N	M	SD
Years of Teaching			
0-5	13	3.2	0.88
6-10	36	2.82	0.78
11-15	22	3.40	0.52
16-20	4	Constant	Constant
Over 20	1	Constant	Constant

Table 21

One-Way ANOVA: Peer tutoring is Ineffective in Technology Instruction and Integration

	Sum of Squares	df	Mean Square	F	Probability
Between Groups	.923	2	.462	.893	.414
Within Groups	37.748	73	.517		
Total	38.671	75			

A One-Way ANOVA procedure was done to examine differences between teachers of varying experience and their agreement or disagreement that “peer tutoring in technology instruction and integration takes away teachers’ responsibility for instruction.” Table 22 shows the mean response across the groups was 3.50, indicating that most of the teachers who completed this survey disagreed with this statement. Overall the results of this ANOVA test reveal no significant differences among the teachers in this category and their attitudes towards peer tutoring in technology instruction and integration.

Table 22

Descriptive Statistics: Peer Tutoring in Technology Instruction/Integration takes away Teachers' Responsibility for Teaching

Characteristic	N	M	SD
Years of teaching			
0-5	13	3.54	0.62
6-10	36	3.44	0.59
11-15	22	3.51	1.55
16-20	4	3.50	0.58
Over 20	1	Constant	Constant

The ANOVA results (Table 23) produced a probability value of 0.880 which is significantly higher than the accepted alpha value of 0.05. The null hypothesis that years of teaching experience is not a factor in this group of teachers' reaction to the statement that peer tutoring in technology instruction and integration takes teachers' responsibility for instruction.

Table 23

Summary of ANOVA Results: Peer Tutoring in Technology Instruction/Integration Takes away Teachers' Responsibility for Teaching

	Sum of Squares	df	Mean Square	F	Probability
Between Groups	2.103	12	.175	.540	.880
Within Groups	20.424	63	.324		
Total	22.526	75			

Another purpose of this research was to determine whether teaching experience was a factor in teachers' attitude towards peer tutoring in technology instruction and integration (see Table 24). Attitudes were measured by specific statements including "computer classes are better when students work individually." An ANOVA test was run to determine the level of significance among teachers in the five categories.

Table 24

Descriptive Statistics: Computer Classes are better when Students work individually

Characteristic	N	M	SD
Years of teaching			
0-5	13	3.35	0.71
6-10	36	3.36	2.25
11-15	22	2.61	0.65
16-20	4	Constant	Constant
Over 20 years	1	Constant	Constant

The results in Table 25 show a mean of 2.11 indicating that teachers with between 5 and over 20 years of teaching experience disagree that computer classes are better when children work individually. Also, the significance probability value of 0.995 illustrated in Table 25 is higher than the accepted alpha value of 0.05. Therefore, there is no significant difference between the teachers' experience with regard to the variable, computer classes is better when students work individually.

Table 25

Results of One-Way ANOVA: Computer Classes are Better When Students Work Individually

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.109	12	.509	.240	.995
Within Groups	133.417	63	2.118		
Total	139.526	75			

The research also examined the differences among teachers with varying levels of teaching experience with regard to the statement, "I capitalize on students' technology skills in technology instruction and integration." Table 26 show the mean response for teachers with 0-5 years' experience (2.78) is higher than teachers within the other experience categories. Teachers with between 0-5 years' experience are less likely to capitalize on students' technology skills while teachers in the categories 6 to 10 years and 11 to 15 years of experience have more of a tendency to capitalize of students' technology skills.

Table 26

Descriptive Characteristics: I Capitalize on Students' Technology Skills in Technology Instruction and Integration

Characteristic	N	M	SD
Years of teaching			
0-5	13	2.78	0.82
6-10	36	2.26	0.93
11-15	22	2.04	0.77
16-20	4	Constant	Constant
Over 20	1	Constant	Constant

However, the ANOVA test (See Table 27) that was run produced a probability value of 0.133 which is higher than 0.05. This suggests that there is no significant difference among teachers of varying teaching experience and their recognition of students' technology skills.

Table 27

Results of One-Way ANOVA: I Capitalize on Students' Technology Skills

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.285	12	.940	1.541	.133
Within Groups	38.452	63	.610		
Total	49.737	75			

Interaction of Independent Variables

This research also examined whether the interaction of pairs of selected independent variables has an effect on teachers' attitudes towards peer tutoring in technology instruction and integration. Teachers' attitudes were determined by teachers' responses to statements that were measured on a five-point Likert scale. The pairs of interacting variables that were investigated were: age and gender, age and teaching level, gender and teaching level, and gender and teaching experience.

Results of Two-Way ANOVA Analyses

The independent variables age and gender and the dependent variable "peer tutoring is ineffective in technology instruction and integration" were selected. In table 28, a Two-Way ANOVA test was applied to determine the effect of the two interacting variables gender and age on teachers' belief that peer tutoring is ineffective in technology instruction and integration.

Table 28

Descriptive Statistics Peer Tutoring is Ineffective in Technology Instruction and Integration

	Age			
	21-30	31-40	41-50	Over 50
Gender				
Male				
N	2	13	20	4
M	2.00	3.02	2.91	3.50
SD	0.00	0.77	0.41	0.00
Female				

N	11	10	14	2
M	3.36	3.31	3.53	2.50
SD	0.62	0.76	0.22	0.00

The Two-Way ANOVA results reveal a probability of (0.195) which is greater than the accepted alpha value of 0.05 (see Table 29). Therefore, there is no interaction between sex and age and teachers' attitude towards technology instruction and integration.

Table 29

Summary of Two-Way ANOVA results: Peer Tutoring is Ineffective in Technology and Integration

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Gender	2.030	1	2.030	4.714	.035
Age	12.062	17	.710	1.647	.086
Gender * Age	3.890	6	.648	1.505	.195
Total	753.000	76			

Possible interactions between gender and teaching level with regard to teachers' attitudes towards peer tutoring in technology instruction and integration were also investigated. Attitudes were measured by teachers' level of agreement or disagreement to the statement "peer tutoring is ineffective in technology instruction and integration." The means and standard deviations for gender and teaching level with regard to the dependent variable are presented in Table 30. The mean response for teachers of each gender and grade level is 3.03 indicating that the teachers disagree or somewhat disagree with this statement “peer tutoring is ineffective in technology instruction and integration.”

Table 30

Summary of Descriptive Statistics: Interaction of Gender and Teaching Level

	Teaching Level		
	6^{th}	7^{th}	8^{th}
Gender			
Male			
N	6	12	21
M	2.50	2.83	3.05
SD	.548	.937	.498
Female			
N	5	9	23
M	3.40	3.11	3.26
SD	.548	.782	.752

The results of the Two-Way ANOVA test in Table 31 indicate a probability of 0.352 which is greater than the accepted alpha value of 0.05. Therefore, there is no interaction between gender and teaching level and teachers’ attitudes towards technology instruction and integration.

Table 31

Summary Table of Two-Way ANOVA Results: Gender and Teaching Level

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Gender	2.967	1	2.967	5.995	.017

Grade Level	.663	2	.332	.670	.515
Gender * Grade Level	1.050	2	.525	1.061	.352
Total	753.000	76			

Interaction of Teaching Experience and Teaching Level

The research also investigated the interaction between the number of years that teachers have taught, the level at which they teach and their reaction to the statement that "In class the teacher might not be the most competent person in technology." A Two-Way ANOVA test was done to determine whether the interaction of these variables had any effect on teachers' beliefs of this statement.

As shown in Table 32, a teacher with between 11 to 15 years of teaching experience that teach on the 6^{th} grade level strongly disagree with the statement " In a class the teacher might not be the most competent person in technology." Teachers with 6 to 10 years' experience who teach on the 6^{th}, 7^{th}, and 8^{th} grade level all agree with regards to their perception on technology competence in the classroom. Teachers with 0 to 5 years' teaching experience agree that in a class the teacher might not be the most competent person in technology. For teachers that agree with the statement, the mean scores ranged from 1.25-2.25.

Table 32

Summary of Descriptive Statistics: In Class the Teacher Might Not be the Most Competent Person in Technology

	Teaching Level		
Years Teaching	6th	7th	8th
0-5			
N	2	6	5
M	2.00	1.25	1.78
SD	0.00	0.00	0.19
6 - 10			
N	8	11	17
M	2.00	2.04	1.91
SD	0.00	0.28	0.13
11-15			
N	1	3	18
M	4.00	2.00	2.05
SD	0.00	0.00	0.61
16-20			
N	0	0	4
M	0	0	2.25
SD	0	0	1.26
Over 20			
N	0	1	0
M	0	2.00	0
SD	0	0.00	0

Table 33 shows the results that were produced from a Two-Way ANOVA analysis of the interaction between the variables years of experience and teaching level with regard to teachers' attitude towards the statement that "In a class the teacher might not be the most competent person in technology." The analyses produced a p value of .232. The calculated probability exceeded the alpha value of 0.05. Therefore, there was no interaction between teaching experience and teaching level and teachers' attitude towards technology instruction and integration is not rejected.

Table 33

Summary of Two Way ANOVA: Interaction between years of Experience and Teaching Level

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Grade Level	2.734	2	1.367	3.403	.041
Years of Teaching	5.434	12	.453	1.127	.360
Grade Level * Years of Teaching	5.407	10	.541	1.346	.232
Total	312.000	76			

The research also investigated whether the variables age and teaching level interacted to influence teachers' perception of the statement: "The benefits of peer tutoring in technology instruction and integration outweighs the inconveniences." The effect of the interacting variables on teachers' belief about this statement was tested. Table 34 shows descriptive statistics and Table 35 highlights the results from conducting Two-Way ANOVA analyses. Teachers (n = 2) over the age of 50 that teach on the 7th grade level disagreed with the statement "The benefits of peer tutoring in technology instruction and integration outweigh the inconveniences." The mean response was 3.00. Teachers in the same age category (Over 50) agreed with the statement as indicated by the mean response of 1.00 for those who teach on the 6th grade level and 2.00 for teachers who teach on the 8th grade level.

Teachers in the 21 to 30 age group along with those in the 31 to 40 and 41 to 50 age groups agreed with the statement that “The benefits of peer tutoring outweigh the inconveniences.”

Table 34

Descriptive Statistics: The Benefits of Peer Tutoring in Technology Instruction and Integration Outweighs the Inconveniences

		Teaching Level		
Age		6th	7th	8th
21-30				
	N	3	6	4
	M	2.25	1.88	2.17
	SD	0.35	0.18	0.24
31-40				
	N	2	6	15
	M	1.50	1.75	1.98
	SD	0.71	0.76	0.28
41-50				
	N	5	7	22

Age		6th	7th	8th
41-50				
	M	1.67	1.88	1.92
	SD	0.00	0.18	0.22
Over 50				
	N	1	2	3
	M	1.00	3.00	2.00
	SD	0.00	0.00	0.00

Results of the Two-Way ANOVA analysis yielded a calculated probability Of.850 which is greater than the accepted alpha value of 0.05. Therefore, age and teaching level do not have an effect on teachers' attitudes with regards to the statement "the benefits of peer tutoring outweigh the inconveniences."

Table 35

Results of Two Way ANOVA: Interaction of Age and Teaching Level

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Grade Level	.161	2	.080	.188	.829
Age	4.359	17	.256	.599	.874
Grade Level * Age	3.268	13	.251	.588	.850
Total	314.000	76			

Interaction of Gender and Teaching Experience

Further analyses were done to investigate whether the interacting variables, gender and teaching experience had any effect on teachers' response to the statement "the benefits of peer tutoring in technology instruction and integration outweigh the inconveniences." Table 36 shows the mean scores of male and female teachers with varying teaching experience.

Generally, male and female teachers with varied years of teaching experience who completed the survey, agreed that the benefits of peer tutoring in technology instruction and integration outweigh the inconveniences. The age group that deviated from this trend was the female teacher with over 20 years of teaching experience. The mean of 3.1 indicates that the one teacher in this category disagreed with the statement.

Table 36

Descriptive Statistics: The Benefits of Peer Tutoring in Technology Instruction and Integration Outweigh the Inconveniences

		Years of Teaching				
		0-5	6-10	11-15	16-20	Over 20
Gender						
Male	N	--	25	10	4	--
	M	--	2.25	1.94	2.00	--
	SD	--	0.47	0.32	0.00	--
Female	N	13	11	12	--	1
	M	1.85	1.75	1.89	--	3.00
	SD	0.46	0.16	0.52	--	0.00

N=76

Two-Way ANOVA Analysis of Gender and Teaching Experience

A Two-Way ANOVA test was conducted to investigate the effect of the interacting variables; gender and teaching experience with regard to the statement “the benefits of peer tutoring outweigh the inconveniences." The results of the Two-Way ANOVA test are shown in Table 37.

Table 37

Two Way ANOVA Analyses: Gender and Teaching Experience

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Gender	.546	1	.546	1.691	.199
Years of Teaching	5.380	12	.448	1.388	.198
Gender * Years of Teaching	1.394	5	.279	.863	.512
Total	314.000	76			

The results of the Two-Way ANOVA show no interaction between gender and teachers' experience with regard to the statement "The benefits of peer tutoring outweigh the inconveniences." The calculated probability value of .512 is greater than the accepted p value of 0.05. Therefore, there is no interaction between gender and teaching experience with regard to teachers' reaction to the survey item "the benefits of peer tutoring outweigh the inconveniences." The interaction of the variables gender and teaching experience do not influence teachers' attitudes with regard to the statement "The benefits of peer tutoring outweigh the inconveniences."

The purpose of this study was to examine the factors that contributed to a group of Southeastern Alabama teachers' attitudes towards peer tutoring in technology instruction and integration. This study will also provide insight into the profile of teachers who are likely to adapt their instruction to accommodate more collaborative approaches to technology-enhanced instruction.

Research Questions and Corresponding Findings

The purpose of this study was to examine the factors that contribute to a group of Southeastern Alabama, 6th, 7th, and 8th grade teachers; attitudes towards peer tutoring in technology instruction and integration. The study provided insights regarding those teachers who are likely to adapt their instruction to accommodate more collaborative approaches to technology. The following research questions were examined:

1. Is there a difference between gender and teachers' attitudes towards peer tutoring in technology instruction and integration?

   There was no difference between males and females with regard to their attitude toward peer tutoring in technology instruction and integration.

2. Is there a difference between grade level taught and teachers' attitudes towards peer tutoring in technology instruction and integration?

   Grade level taught was not a factor in determining teachers' attitudes towards peer tutoring in technology and integration.

3. Is there a difference between teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

   With regard to teachers' attitudes towards peer tutoring in technology instruction and integration, teaching experience had no effect.

4. Is there an interaction between age and gender with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

Interaction of age and gender had no effect on teachers' attitudes towards peer tutoring in technology instruction and integration.

5. Is there an interaction between gender and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

   There was no interactive effect of gender and teaching level with regard to teachers' attitudes towards peer tutoring in technology instruction and integration.

6. Is there an interaction between gender and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

   The interacting variables gender and teaching experiences had no influence on teachers' attitudes towards peer tutoring in technology instruction and integration.

7. Is there an interaction between teaching level and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

   There was no interaction between teaching level and teaching experience with regard to teachers' attitudes towards peer tutoring in technology instruction and integration.

8. Is there an interaction between age and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

   Interaction of age and teaching level appears to have no effect on teachers' attitudes towards peer tutoring in technology instruction and integration.

9. Do teachers of technology and those who integrate technology into their instruction perceive peer tutoring differently?

   Teachers of computer technology and those who integrate technology into their instruction perceive peer tutoring in technology instruction and integration similarly.

This section of the study provides the results of statistical analysis that were conducted to answer specific research questions regarding the attitudes of teachers from school systems in Central and Southeast Alabama towards peer tutoring in technology instruction and integration. The section also restated the research questions for this study and presented the findings based on statistical analyses. There is no significant difference among age, grade level taught and teaching experience and teachers' attitudes towards a peer tutoring approach to technology instruction and integration. The following section will provide a summary of the open–ended responses that were collected for this study.

Summary of Open-ended Survey Questions

This study examined teachers' attitudes towards a pedagogical approach towards technology instruction and integration. Therefore, in addition to quantitative analyses, three open-ended questions were used to investigate more varied and textured responses from respondents. Open-ended questions, permits a respondent to provide unstructured responses of varying length and detail. Answers could come in the form of a list, or a few sentences. For this reason, the following open-ended questions were asked: *"What are your concerns about peer tutoring in technology instruction/integration?"*, *"What do you see as the advantages of peer tutoring in* *technology instruction/integration?"* and *"What do you see as the disadvantages of peer tutoring in technology instruction/integration?"*

When questioned about their concerns regarding the use of peer tutoring in technology instruction and integration, recurring statements such as "need to develop policies and procedures for implementing the program," "only competent/responsible students should be chosen to curtail discipline problems." These responses suggests that behavior management and administrative resources played a key role in teachers' choices of instructional strategies. The teachers implied that while they are aware of the benefits of utilizing a peer tutoring approach to technology instruction and integration, the presence of disruptive students can interfere with this strategy. Evidently, teachers view classroom management as being crucial to effective instruction. Consequently, they plan their instruction with this in mind. A significant number of teachers indicated that they did not have any concerns about peer tutoring in technology instruction and integration. Most stated that they love the strategy and often use peer tutoring and have found it to be very effective.

When teachers were asked, "What do you see as the advantages of peer tutoring in technology instruction/integration?" Many of the teachers indicated that the advantages include, "builds self-confidence, leadership skills, critical thinking skills and responsibility," response statements such as "develops leadership skills," "helps lower level students with cognitive development," "helps with classroom management," "peers listen to each other better," indicated that classroom management played a key role in teachers' instructional strategies. Teachers also cited the benefits of peer to peer interaction indicating that students listen to their peers better than they do their teacher.

When questioned about the disadvantages of peer tutoring in technology instruction and integration, many of responses were "None" and "Not Applicable."

Teacher's indicated that the statement was not applicable to their perceptions of peer tutoring in technology instruction and integration and other teachers had no response to the question. The responses suggest that there are no disadvantages in regards to peer tutoring in technology instruction and integration.

Based on the research findings teachers will need to promote a collaborative learning environment which will increase cognitive demands and facilitate participation in the construction of knowledge by keeping the learning task challenging. Peer tutoring and technology integration is the key, and teachers' attitudes will influence student outcomes.

Summary

Chapter 4 presented the findings from this research that investigated whether and the extent to which factors such as: age, gender, teaching level and years of experience influenced the attitudes of a group of teachers towards peer tutoring in technology instruction and integration. The research also provided opportunities for teachers to indicate other factors that may be barriers or advantages to applying a peer tutoring approach to technology instruction and integration.

For the 76 teachers who participated, individual factors such as age, gender and grade level appeared to have no effect on their attitudes towards peer tutoring in technology instruction and integration. Teachers across the various categories responded similarly to most of the survey items. Regardless of their age, gender, teaching experience and grade level taught, they identified that: peer tutoring is effective in technology instruction and integration; capitalizing on students' technology skills can yield both cognitive and affective benefits. They also valued peer tutoring for its effectiveness in developing leadership skills and self-confidence. The preceding chapter outlined statistical and qualitative findings from this study to investigate the attitudes of teachers towards peer tutoring in technology instruction and integration. Chapter 5 will summarize and discuss the findings of this study and their implications for educational practice. The chapter will also provide recommendations for future research on peer tutoring and technology instruction and integration.

Chapter 5

Summary, Conclusions, Implications and Recommendations

Introduction

Technology is changing so fast that it is almost impossible to plan what type of technology will be available for use five years from now. Even one year plans may be about as far ahead as we can now effectively plan for specific purchases of certain types or brands of equipment (Anderson, 1996). For that reason, there was a need to study the attitudes of teachers towards peer tutoring in technology instruction and integration.

The purpose of this research was to investigate teachers' perceptions of the use of peer tutoring and technology (Bloom, 1975; Goodlad, 1979; Grabe & Grabe, 2001; Klaus, 1975; Lengel & Lengel, 2006; Rosenbaum, 1973; Thompson, 2007). Teacher's attitudes towards peer tutoring in technology instruction and integration in Alabama rural and urban school districts were examined. This research identifies common concerns that teachers experience with students' cognitive processes from developmental to information processing.

The objective of this study was to determine whether or not there was a significant and direct relationship to peer tutoring and student success in the classroom through technology instruction and integration. A survey was proposed to define the contributing factors of teachers' attitudes towards peer tutoring in technology instruction and integration. Other variables examined were: gender, age, teaching experience, grade level, and teacher's attitudes. This study also developed a profile of teachers who were likely to utilize a direct technology instruction or instruction that involves the use of computers to reinforce learning and to accommodate more collaborative approaches to technology-enhanced instruction as proposed by Coote–Thompson (2007).

Research Questions

For the purpose of this study, the following specific research questions were used:

1. Is there a difference between gender and teachers' attitudes towards peer tutoring in technology instruction and integration?
2. Is there a difference between grade level taught and teachers' attitudes towards peer tutoring in technology instruction and integration?
3. Is there a difference between teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
4. What is the relationship of age and gender with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
5. What is the relationship of gender and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
6. What is the relationship between gender and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
7. Is there an interaction between teaching level and teaching experience with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?
8. What is the relationship between age and teaching level with regards to teachers' attitudes towards peer tutoring in technology instruction and integration?

Summary

The primary role of public education in America is to prepare students for the responsibilities of effective citizenship. An effective citizen is one who is capable of contributing to the general welfare of his country through social, economic, and political participation. However, there are some who may not be able to fulfill this task if the appropriate schooling is not provided (Dewey, 1897).

In a global world community, students are expected to be responsible digital citizens who practice safe, legal, and responsible use of technology systems and digital media. Students must comprehend the impact of technology on the cultural, social, economic, environmental, and political aspects of society. Positive attitudes toward technology use are essential to support collaboration, learning, and productivity for success in the twenty - first century. A peer tutor can form examples and relate to a student on an entirely different level than an adult educator.

Teaching and learning are highly social activities. Interaction with teachers, peers, and other participants is a major influence on the cognitive and affective attainments of learners. Social interaction among participants in learning contexts is seen as the primary source of cognitive and social development (John–Steiner, 1996). Research on social relationships and interactions among students has been ongoing since the early nineteenth century. Some arrangements of peer learning, such as peer tutoring, clearly emphasizes that the tutee is the intended learner. The first step in providing positive interactions among students is providing opportunities for them to interact. This means structuring activities and assigning students to groups so that interactions become a part of the classroom instruction (Grabe & Grabe, 2001). A growing number of research studies demonstrated the positive outcomes of peer tutoring on student achievement (Stenhoff & Lignugaris/Kraft, 2007). More recently, in–school helping relationships, have been viewed as a vehicle for diversifying and redefining the role of the classroom instructor, as a response to personnel and resource limitations, and to facilitate learning through the powerful influence of peer relationships (Fulk & King, 2001). These studies (Fulk & King, 2001; Stenhoff & Lignugaris/Kraft, 2007) suggested that it was important to have a well-planned program. Results of reviewed studies suggest that peer tutoring is an effective intervention in improving the academic achievement of students. Some of the studies reviewed for the purpose of this research are: (Herson, Lloyd, Stamer & Sosabowski, 2003; Sugar, W., Crawley, F. &and Fine, B. 2004) who conducted research to investigate the attitudes of teachers towards technology in instruction. Studies have also investigated the effect of peer tutoring on improving students' reading and writing skills (Burnish, T. Fuchs, D., & Fuchs, L.S., 2005; Green, Alderman & Liechty, 2004; Medcalf & Moore, 2002). Others have examined the perception of student peer tutoring in a problem-based learning environment (Solomon & Crowe, 2001; Verba, 1998), how cross age tutoring can influence mathematical ability (Li, 2005; Topping, Campbell & Smith, 2000) and how peer tutoring techniques can be used with students who show evidence of learning and behavior challenges (Brewer, Reid & Rhine, 2003). Research has also examined technology use by Hispanic bilingual teachers (Simonsson, 2004). Coote-Thompson (2007) investigated teachers' perception of combining peer tutoring with technology or integration to increase learning outcomes.

The Alabama State Department of Education (2008) adopted a technology initiative called IMPACT (Indicators for Measuring Progress in Advancing Classroom Technology), which revealed that, Alabama's goal of technology fluency for every student, necessitates the seamless integration of technology and twenty-first century skills throughout the curricula. The immersion of technology into the curriculum provides an engaging means for students to locate, assemble, and apply relevant information to make connections with essential knowledge.

The overarching purpose of IMPACT is to improve learning through the use of technology. The goal of IMPACT is to provide a framework for the design of local schools and school districts technology plans for integrating technology across the curriculum. The vision of IMPACT is to leverage the unique powers of technology to provide challenging, stimulating learning opportunities for students throughout the state. This vision is further articulated into component goals that are intended to support the vision and provide a framework for the design of local school and school district technology plans. Further, the goals and objectives exist as the framework for assessing the state of Alabama's progress toward advancing classroom technology across the state (Alabama State Department of Education, 2008). Data collected on the status of this progress is reported to the U.S. Department of Education as part of federal reports. Due to the confluence of federal, state, and local funding streams, the results shared in this report represent an overall picture of the use of technology in Alabama.

The immersion of technology into the curriculum provides an engaging means for students to locate, assemble, and apply relevant information to make connections with essential knowledge. Effectively integrating technology can extend learning beyond the classroom to ensure that all students achieve the technology fluency necessary to succeed in a global society. The choice not to use computer technology in classrooms is no longer an option for teachers. The issue is how to best prepare future teacher educators to meet the demands of teaching and learning in a technology rich world. School districts must employ the most effective method for assisting future generations in meeting these demands. The Alabama State Technology plan provides School districts educators with a detailed description of how to move to the system-wide integration of computer technology into the teacher education curriculum (Alabama State Department of Education, 2008).

Peer tutoring is a longitudinal strategy that can be utilized across subject areas, for that reason, this research was not limited to a time period or particular subject area. The study examined the attitudes of seventy-sixth, seventh and eighth grade teachers towards peer tutoring in technology instruction and integration. This research study was conducted to determine the factors that contributed to this group of teachers' use of peer tutoring in technology instruction and integration. This study focused on teacher's who teach computer applications/technology and teachers who integrate computer applications/technology in instruction. The teachers included in this study ranged in ages of 21 through 60 to determine their attitudes towards peer tutoring in technology instruction and integration. The attitudes of teachers were measured by statements on a survey that were rated on a five-point Likert scale.

This research was conducted using a modified version of the Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration Survey developed by Dr. Claudette Coote-Thompson (2007). The original design of the survey was influenced by Rosenberg's (1990) theory of the relationship between social property, affective variables and dispositions or behavioral variables (Coote-

Thompson, 2007; Rosenberg, 1990). Items for the instrument were developed to assess each of these factors based on the review of literature and various statistical methods.

This research study examined teachers who were likely to utilize a pedagogical strategy either for direct technology instruction or instruction that involves the use of computers to reinforce learning by teachers adapting their instruction to accommodate collaborative approaches to technology-enhanced instruction. Teachers' response to an attitudinal survey defined the quantitative components of this research. Quantitative, mainly deductive methods are ideal for measuring pervasiveness of "known" phenomena and central patterns of association, including inferences of causality (Pasick et al., 2009). The study analyzed data pertaining to the participants' attitudes of peer tutoring, in relationship to specific questions related to the integration of technology in the classroom. Based on the research questions, a quantitative design method was selected. The data collected in the survey included demographic, and quantitative questions which were used to determine the attitudes of teachers towards peer tutoring in technology instruction and integration. Using this particular research design allowed for the observance of additional research to show variance in teachers' backgrounds, demographics, and perceptions collaboratively. Interpretation and validation of the data was done throughout the data collection process. For this study, one qualitative question was added, "What do you see as the disadvantages of peer tutoring in technology instruction and integration?" for a total of three open–ended questions. Two of the original quantitative questions were deleted, "I do not teach computer technology but I integrate it in my instruction" and "I teach computer technology and integrate it into my instruction". The following questions replaced them, "I integrate computer applications/technology in my instruction", "Have you ever used peer tutoring?", "Peer tutoring is effective in technology instruction and integration" and "Students are more engaged when they share what they know". As a result of the Q–Sort, these questions improved the clarity and readability of the questions. These five questions assisted in validating the use of the survey instrument for assessing teachers' attitudes towards peer tutoring in technology instruction and integration.

Based on review of the literature some factors including gender, age, race, teaching experience and teaching level may influence teachers' attitudes towards a peer tutoring approach to technology instruction and integration but did not create a barrier for this research. To examine whether, or to what extent to which these factors affect teachers' attitudes towards a peer tutoring approach to technology instruction and integration, the statistical analyses of Independent Samples T-test, One-way and Two-Way ANOVA were applied.

The sample was comprised of teachers with varying demographic profiles including gender and age. The data presented in this research found a total sample of 76 participants, most of the teachers were male (51.3%), and 44.8% were within the 41-50 years of age category. The age category, 31-40, represented the second highest percentage (30.2%) of teachers who completed the survey. The number of teachers in the two age groups, 21 to 30 (n=13) and Over 50 (n=6) differed by only 9.2% represented the lowest percentage of teachers who completed the survey. As pertaining to race, Caucasians (44.7%) represented the highest number of participants in this study, African Americans at (22.4%), Asians at (9.2%), Hispanics at (9.2%), and other ethnicities at (14.5%), this is not a representative account of teachers attitudes but only of their willingness to participate in this study and will not have a direct effect on teachers' attitudes towards peer tutoring and technology integration.

Independent Samples T-test were used to respond to the research questions that examined the differences between the means of two independent groups with regards to their attitudes towards peer tutoring in technology instruction and integration. The independent groups, gender (male and female), and technology instructor and integrator were examined in this study. An Independent Samples T-test was done to determine whether there was a difference between gender and teachers' attitude with regard to teachers' belief that the benefits of peer tutoring outweigh the inconveniences. The research shows no significant difference between male and female teachers' attitudes with regard to the variable, "the benefits of peer tutoring outweigh the inconveniences."

A One-Way ANOVA was used to analyze the independent variables with more than two levels. Specifically, a One-Way ANOVA was applied in this research to examine whether age, grade level taught and teaching experience played significant roles in teachers' attitude towards a peer tutoring approach to technology instruction and integration. These independent variables were divided into sub-categories. For example teachers who completed the survey fell into one of four age groups: 21-30, 31-40, 41-50 and over 50. The teachers also taught various grade levels. For statistical analysis, the grade levels examined were 6^{th}, 7^{th}, and 8^{th} grades. Teachers who volunteered to complete the survey taught between one to over 20 years. Therefore the variable, years of experience was subdivided into five groups; 0-5 years, 6-l0 years, 11-15 years, 16-20 years, and over 20 years. The groups were recoded into two or three subdivisions to facilitate One-Way ANOVA tests. Overall, the mean age of the predominately male sample is 40 plus years of age with a mean teaching experience of

6 to 10 years. The majority of the teachers who were surveyed taught 8th grade. The number of teachers who integrate technology into their instruction (100%) is significantly higher than those who teach computer technology as
an independent subject (21.1%), this difference did not create a barrier to the research, the increase in the use of technology is ideal for this study which shows that there will be a need for peer tutoring and the attitudes of teachers towards this pedagogical strategy is relevant for this population.

Post Hoc Tests were conducted to investigate differences between sub-groups. For this research, teachers in four age categories, three grade levels and five teaching level sub-categories completed the survey. Based on these demographic characteristics a One-way ANOVA was applied to analyze the significance of the means of these variables. For this test an F ratio is compared with the accepted value of 0.05.

This research also investigated whether there was an interaction between independent variables and the influence on teachers' attitudes towards a peer tutoring approach to technology instruction and integration. The interacting variables that were examined in this research are: age and gender, gender and grade level taught, and years of experience and grade level taught. For this analysis, a Two-Way ANOVA was used to investigate the effects of various pairs of interacting variables on teachers' attitude towards a peer tutoring approach to technology instruction and integration. Results of the Two-Way ANOVA analysis yielded a calculated probability of .850 which is greater than the accepted alpha value of 0.05. Therefore, age and teaching level do not have an effect on teachers' attitudes with regards to the statement "the benefits of peer tutoring outweigh the inconveniences." The findings on the attitudes of teachers' towards peer tutoring in technology instruction and integration revealed that the quaitative questions provided insight on teachers' specific attitude towards peer tutoring and technology integration needs. The responses confirmed a need to provide more services and programs to the targeted population. Another generalized and substantial perception on teachers' attitude towards peer tutoring and technology integration highlighted in this study was a need for teachers to engage in professional development programs that assist with the peer tutoring and technology integration process. Educators possess an opportunity for future implications which center on providing experiences which meet the needs of the student. There must be a clear and concise understanding regarding their perceptions, and possible barriers to the learning process.

This study also examined teachers' attitudes towards a pedagogical approach in technology instruction and integration. Therefore, in addition to quantitative analyses, three open-ended questions were used: "What are your concerns about peer tutoring in technology instruction/integration?", "What do you see as the advantages of peer tutoring in technology instruction/integration?" and "What do you see as the disadvantages of peer tutoring in technology instruction/integration?" The second open-ended question on the survey asked, "What do you see as the advantages of peer tutoring in technology instruction and integration?" Many of the teachers agreed that the advantages include, "builds self-confidence, leadership skills, critical thinking skills and responsibility." Teachers also indicated that peer tutoring in technology related practices helped students' to develop cognitive skills. Teachers also cited the benefits of peer to peer interaction indicating that students listen to their peers better than they do their teacher. When asked "What do you see as the disadvantages of peer tutoring in technology instruction/integration?" teacher's indicated that the statement was not applicable to their perceptions of peer tutoring in technology instruction and integration and other teachers had no response to the question.

Based on the research findings teachers will need to promote a collaborative learning environment which will increase cognitive demands and facilitate participation in the construction of knowledge by keeping the learning task challenging. Peer tutoring and technology integration is the key, and teachers' attitudes will influence student outcomes.

Conclusion

This study provided a framework to identify resources that could be used to motivate teachers to incorporate technology in their instruction. Too often technological resources that are provided for teachers are limited to hardware and software (Means, Padilla, Penuel and Penuel, 2001). Additionally, the use of action research or the actual task of teachers being given templates from which to develop instructional units that combine technology integration and cooperative learning strategies provide them with learning experiences that are relevant to day to day teaching (Coote-Thompson, 2007).

This research was designed to examine teachers' attitudes towards peer tutoring in technology instruction and integration. It was also designed to provide insight on the profiles of teachers who are likely to adapt their instruction to accommodate a more collaborative approach to the integration of technology in the classroom. For the 76 teachers who participated, individual factors such as age, gender and grade level appeared to have no effect on their attitudes towards peer tutoring in technology instruction and integration. Teachers across the various categories responded similarly to most of the survey items. Regardless of their age, gender, teaching experience and grade level taught, they identified that: peer tutoring is effective in technology instruction and integration; capitalizing on students' technology skills can yield both cognitive and affective benefits. Therefore, a profile of teachers who are likely to adapt their instruction to accommodate a more collaborative approach to the integration of technology in the classroom could not be developed.

Teachers, for this study, comprised of 76 individuals, 6-8 grade teachers from school settings in Alabama. The ages of the teachers ranged from 21 to 60 years. Also examined was the relationship between teachers' age as well as their length of service or experience in the profession and their attitudes towards using peer tutoring in instruction and integration. Demographic data was gathered for these 6-8 grade teachers in specific school districts located in Alabama. Gender was an independent variable that was investigated in this research. The population consisted of 300 practicing public school teachers, a total of 145 surveys were returned and for the purpose of this study 76 respondents were analyzed. These school districts were selected as the responses from the combined population will reflect diverse views from urban and rural school settings in southeastern Alabama which allowed me to develop a representative picture of the attitudes and characteristics of both small and somewhat larger populations of teachers (see Appendix H).

Limitations of the study included factors such as limited resources and the scope of this research, the survey instrument that was used is small scale and cross-sectional. The response rate was small, meaning that the data was collected from a relatively small sample. The limitations of the study does not mean that the study did not accomplish its' purpose. There will be a need for additional research to implement a strategic program that can be utilized by teachers in the classroom. The Q-sort process, pilot testing, and survey revisions affected the length of time it took to complete the study.

For the purpose of this study teachers who taught students in grades six through eighth were chosen because the students in grades six through eighth possess a wide range of intellectual abilities, learning styles, talents, and interests. These students are experiencing a transitional period that includes physical, social, emotional, and intellectual changes. In addition, students in grades six through eighth are developing skills to function in a technological society that far spans the knowledge of their teacher. In a world where information increases exponentially, students are expected to develop and use critical-thinking and decision-making skills. Digital tools enhance middle school students' emerging abilities to analyze, synthesize, and evaluate information.

The overall survey responses of teachers' (*N*=76) who taught technology and those who integrated it in their instruction showed that teachers were aware that successful integration of technology systems expands and optimizes their ability to use information and to communicate and collaborate with diverse individuals. The technology content standards for Grades six through eighth grades are designed to complement all areas of the academic curriculum (Alabama Course of Study, 2009). It is critical for students at these grade levels to expand the knowledge and skills necessary for solving both hypothetical and authentic problems. In addition, many students are entering education programs with increased levels of computer use and with the expectation of using and integrating computer technology by their instructors. As students are asking for more computer technology integration and administrators are providing access and training, teachers must seize every opportunity to prepare themselves for increased computer technology use.

Galin and Latchaw (1998) found that in order to meet the technology and integration goal, teachers are called upon to explore, evaluate, and create teaching strategies that enable them to use technology in K-12 classrooms. Success is dependent upon supportive leaders who provide assistance in funding, access to adequate facilities, and systematic faculty development.

Implications

The Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration was conducted to expand on the study by Coote–Thompson (2007), to understand the perception of teachers implementation of a strategy that maybe beneficial to them in the classroom. The information gathered will be helpful to teachers, administrators, and the researcher in developing resources, services, and programs to fit the needs of teachers in the classroom. This study will provide the foundation for continued research with peer tutors and technology integration and for the formulation and design of strategic pedagogical programs in the public schools systems.

The Alabama State Department of Education (2008) adopted a technology initiative which enforces schools in Alabama to integrate technology in instruction. The findings that emerged from this study may assist school board members, administrators, and principals of schools in re-designing their programs in an effort to increase student collaboration and competence through the use of technology in the classroom. Teachers are the avenue through which these efforts will be administered. In addition school administrators may find this information useful in developing a peer tutoring program that will assist them in the classroom.

The Alabama State Department of Education (2008) found that pressures from both the society at large and the standards movement are increasing the need for

States' Boards of Education to ensure that the teachers they are training are capable of integrating computer technology into the K-12 curriculum . This researchers' goal is to begin the process for teacher education strategies and programs seeking to meet the goal of the Alabama State Department of Education, and that is to ensure that the teachers they are training are capable of integrating computer technology into the K-12 curriculum while incorporating the peer tutoring strategy. These goals will also be extended to other boards of education in various states and cities to utilize this pedagogical strategy to meet individual student needs.

The Information Age for students can be exciting if teachers are informed enough to integrate technology into the curriculum. This Information Age is instrumental in providing the course for technological advancement as did the Industrial Revolution. Educators have been commissioned to provide students with the tools necessary to jumpstart this technological advancement. Technology is not a means for solving instructional problems, what it does is equips students with the necessary tools that were not previously available. Technology offers students opportunities and possibilities that would not be available without it (Alabama Course of Study, 2002).

This study serves as a model for developing proposals that may attract funding as well as provide real tools for teachers to integrate technology with constructivist modes of teaching in meaningful ways. This approach to curriculum and instructional support will lessen teachers' beliefs that learning experiences are too far removed from day to day teaching to be effective. If teachers are to successfully merge technology integration with appropriate pedagogy they need time, tools and strategies (Taylor, 2004). Teachers and Administrators may use the results of this research to construct and implement a peer tutoring program, provide training to teachers who are dispositional in using the peer tutoring strategy in their school, provide training to teachers who are dispositional in using technology, secure funding for peer tutoring programs and technology integration and to conduct more research on peer tutoring strategies.

Recommendations for Future Research

The results of this study, have highlighted important data as well as fundamental issues in Peer Tutoring and Technology Integration. The meaning of these attitude changes cannot be interpreted without further study, including but not limited to follow-up. Future studies can continue to examine advancing areas of that innovative change.

Additional research should be conducted to address teachers' technology competency. Such studies may want to focus on professional development, and certifications in technological concentrations. Additional studies may address students' technology competency and increase opportunities for students to compete with students in other districts, and develop a system to gather feedback from students. Therefore, future research would also benefit from inquiry into specific programs, services, and resources for teachers in the instrumentation of the pedagogical strategy of peer tutoring and the integration of technology in the classroom.

This study was conducted to better understand teachers' willingness to incorporate the peer tutoring teaching strategy through the use of technology into their curriculum. Effectively integrating technology can extend learning beyond the classroom to ensure that all students achieve the technology fluency necessary to succeed in a global society. The information gathered will be helpful in developing resources, services, and programs to fit the needs of teachers and students. Therefore, future research would also benefit from inquiry into specific teaching strategies, programs, services, and resources for teachers and students. Future recommendations will be to talk with teachers that are actively implementing the use of peer tutors to aid in instruction while incorporating the use of technology.

Future research in the area of teachers' attitudes towards peer tutoring in technology instruction and integration would greatly benefit from a much larger research study with the inclusion of a more diverse population of teachers which spans across a larger demographic area. With further inquiry, a determination and verification related to the study of the attitudes of teachers towards peer tutoring in technology instruction and integration would be beneficial to securing sound research based strategies that can be implemented universally by all teachers.

Future implications stress the need for increased resource allocation, teacher professional development, and the effective administration of the peer tutoring strategy in technology instruction and integration. Further research is needed to replicate these findings and further establish the effectiveness of specific peer tutoring interventions for selected target problems. Technology grants that include training as part of the resources is an excellent incentive for teachers' professional development growth and technology enhancement skills.

Diversity can provide the researcher with a spectrum of data which more appropriately and accurately represents the larger targeted population. Additional studies can focus primarily on specific ethnic groups to compare similarities or differences in perceptions regarding successful integration. Such studies are valuable for strategic planning purposes in the development of programs and services to encompass diversity.

Additional recommendations for future research involve studies which examine the development, implementation and evaluation of peer tutoring programs with emphasis in technology instruction and integration. Benefits from such a study involve highlighting the strengths and weaknesses of the program along with its impact on the students as well as teachers. There is no doubt that technology will continue to play a major role in education and in our society. Students are involved in their own classroom environments, which has an impact on student's cognitive development. Teachers need to also learn about student's cultures and teach in a manner that is responsive to the cultures. The results of this research study, indicates that teachers are willing to support technologically sound strategies and methods to enhance learning.

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APPENDIX A: Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration Survey by Claudette Coot-Thompson (2007)

Please read the following definitions before completing the items which follow.

Peer Tutoring is a process by which a competent pupil with minimal training and with a teacher's guide helps one or more students at the same grade level to learn a skill or concept.

Technology Instruction refers to the teaching of computer application as an independent subject.
Technology Integration refers to the use of computer technology to enhance the teaching of any K-12 lesson in all subjects including Language Arts, Mathematics, Science and Social Studies.

Please read each statement and then place an X in the box below the number which best describes how you feel. **1=Strongly Agree, 2=Agree, 3=Disagree, 4=Strongly Disagree**

	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
	1	2	3	4	5
1) Peer tutoring can help students to improve their computer technology skills.	☐	☐	☐	☐	☐
2) In a class the teacher might not be the most competent person in technology	☐	☐	☐	☐	☐
3) Only competent students should be assigned as peer tutors.	☐	☐	☐	☐	☐
4) The benefits of peer tutoring in technology instruction/integration outweigh the inconveniences	☐	☐	☐	☐	☐
5) Peer tutoring in technology instruction/integration takes away teachers responsibility for instruction	☐	☐	☐	☐	☐
6) Computer classes are better when students work individually.	☐	☐	☐	☐	☐
7) Students should collaborate only on difficult technology assignments	☐	☐	☐	☐	☐
8) Students should learn to teach each other technology skills because that's how it is in the workplace	☐	☐	☐	☐	☐
9) Students' competence in technology should be recognized	☐	☐	☐	☐	☐
10) I capitalize on students' technology competence in technology	☐	☐	☐	☐	☐

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instruction/ integration

	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
	1	2	3	4	5
11) Students who are more techno-savvy are intimidating					
12) Peer tutoring is ineffective in technology instruction and integration	□	□	□	□	□
13) Computer classes are better when students are allowed to work in pairs	□	□	□	□	□

The following questions require you to indicate your use of technology

	Yes	No
14) I teach computer application/technology	□	□
15) I do not teach computer technology but I integrate it in my instruction	□	□
16) I teach computer technology and integrate it into my instruction	□	□

17) What are your concerns about peer tutoring in technology instruction/integration?

18) What do you see as the advantages of peer tutoring in technology instruction/integration?

Demographic Information

19) **Gender**

Male ☐ Female ☐

20)	Age	21-30	31-40	41-50	Over 50		
		☐	☐	☐	☐		
21)	Race	White	African American	Asian	Hispanic	Native American	Other
		☐	☐	☐	☐	☐	☐
22)	Years of Teaching	0-5	6-10	11-15	16-20	Over 20	
		☐	☐	☐	☐	☐	
23)	The level at which I teach is	K-2	3-6	7-9	9-12		
24)	My school is considered to be	Rural	Suburban	Urban			
		☐	☐	☐			

If you are willing to participate in a semi-structured interview please write your e-mail address or telephone number here:

____

THANK YOU FOR COMPLETING THIS SURVEY

REFERENCES

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U.S. department of Education. (2007, July). What works clearinghouse: *Classwide Peer Tutoring*. Retrieved June 14, 2008, from WWC Intervention Report Online via GPO Access: http://ies.ed.gov/ncee/wwc/pdf/WWC_Peer_Tutoring_070907.pdf

APPENDIX B: Successful attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration Survey by Jannie Jordan (2014)

Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration

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Please read and refer to the following definitions before completing the questions:

Peer Tutoring is a process by which a student with minimal training and with a teacher's guide helps one or more students at the same grade level to learn a skill or concept.

Technology Instruction refers to the teaching of computer applications as a subject.

Technology Integration refers to the use of computer technology to enhance the teaching of any K-12 lesson in all subjects including Language Arts, Mathematics, Science and Social Studies.

Demographics

Please answer each statement by placing a check in the appropriate box:

1) **Gender:** Male ◻ Female ◻

2) **Age:** _________________

3) **Race:**

White	African American	Asian	Hispanic	Native American	Other
◻	◻	◻	◻	◻	◻

4) **Years of Teaching:** ______________

5) **Grade level that you teach is:**

6th	7th	8th
◻	◻	◻

<u>Peer Tutoring</u>
Please indicate your use of technology and peer tutoring in the classroom:

Statements	**Yes**	**No**
6) I teach computer applications/technology.		
7) I integrate computer applications/technology in my instruction.		
8) Have you ever used peer tutoring?		

	Often	**Sometimes**	**Rarely**	**Never**
9) How often do you use peer tutoring?	☐	☐	☐	☐
10) How often do you integrate technology in instruction?	☐	☐	☐	☐

<u>Technology Instruction and Integration</u>

Please read each statement and check the box below the number which best describes how you feel.

1=Strongly Agree, 2=Agree, 3=Disagree, 4=Strongly Disagree, 5=Not Applicable

Statements	**Strongly Agree 1**	**Agree 2**	**Disagree 3**	**Strongly Disagree 4**	**Do Not Know 5**
11) Peer tutoring can help students to improve their computer technology skills.	☐	☐	☐	☐	☐
12) In a class the teacher might not be the most competent person in technology.	☐	☐	☐	☐	☐
13) Only competent students should be assigned as peer tutors.	☐	☐	☐	☐	☐
14) The benefits of peer tutoring in technology instruction/integration outweigh the inconveniences.	☐	☐	☐	☐	☐
15) Peer tutoring in technology instruction/integration takes away teachers responsibility for instruction.	☐	☐	☐	☐	☐
16) Computer classes are better when students work individually.	☐	☐	☐	☐	☐
17) Students should collaborate only on difficult technology assignments.	☐	☐	☐	☐	☐
18) Students should learn to teach each other technology skills because that's how it is in the workplace.	☐	☐	☐	☐	☐
19) Students competence in technology should be recognized.	☐	☐	☐	☐	☐
20) I capitalize on students' technology competence.	☐	☐	☐	☐	☐
21) Students who are more techno-savvy are intimidating.	☐	☐	☐	☐	☐
22) Peer tutoring is ineffective in technology instruction and Integration.	☐	☐	☐	☐	☐
23) Peer tutoring is effective in technology instruction and Integration.	☐	☐	☐	☐	☐
24) Computer classes are better when students are allowed to work in pairs.	☐	☐	☐	☐	☐
25) Students are more engaged when they share what they know.	☐	☐	☐	☐	☐

Technology Instruction and Integration

26) What are your concerns about peer tutoring in technology instruction/integration?

27) What do you see as the advantages of peer tutoring in technology instruction/integration?

28) What do you see as the disadvantages of peer tutoring in technology instruction and integration?

THANK YOU FOR COMPLETING THIS SURVEY

APPENDIX C: Email from Dr. Coote-Thompson concerning the validity and reliability of her survey

RE: Dissertation: Attitudes of Western Pennsylvania Teachers Towards Peer Tutoring in Technology Instruction and Integration

Thompson, Claudette <cthompso@sbu.edu>

Fri 4/27/2012 5:49 PM

To:

Jannie Jordan;

You replied on 4/27/2012 6:35 PM.

Jannie

Thanks for your continued interest in my research. While I did not use the term domains in my study, my questions were framed around Rosenberg's (1990) theory which explores relationships among social property, affective variables, and dispositions or behavioral variables. For example older teachers would represent a social category, their intimidation to reveal their discomfort with technology is dispositional. The use of technology is behavioral based on Rosenberg's theory. I also designed my survey questions around finding causes for the relationship (Punch 2003). Some of my research questions explore relationship. Reading pages 54 and 55 of my dissertation may make this clearer. See also my research question on page 3.

It will also help if you read Survey Research by Punch and Statistics for the behavioral scientist by Rosenberg.

The best time to reach me at work is Mondays or Wednesdays between 10.30 and noon.

I hope this helps.

Dr. Thompson

APPENDIX D: Q-Sort Directions

A Q-Sort Assessment Test for Validity and Reliability of the survey: "Teachers Attitudes Towards Peer Tutoring in Technology Instruction and Integration"

The enclosed material is representative of a Q-Sort which is an assessment procedure for measuring congruence, a state of internal consistency which requires subjects to sort items relative to one another along a dimension such as "agree"/"disagree" for analysis by Q-methodological statistics. Please read the directions, and complete the Q-Sort.

Please read and refer to the following definitions before completing this activity:

- **Technology Instruction** refers to the teaching of computer applications as a subject.
- **Technology Integration** refers to the use of computer technology to enhance the teaching of any K-12 lesson in all subjects including Language Arts, Mathematics, Science and Social Studies.

Definition of domains:

1. **Peer Tutoring** is a process by which a student with minimal training and with a teacher's guide helps one or more students at the same grade level to learn a skill or concept.
2. **Student Competence** Students' ability to recognize when information is needed and to locate, evaluate, and use that information effectively.
3. **Student Collaboration** The assistance that learners require may be provided by experts such as teachers and by peers, who collectively have expertise distributed among them. When students work together they learn from one another and extend their interaction and learning outside of the classroom.

Materials:

1. Envelope
2. 3 Paper clips
3. 3 strips of paper with the domains for my survey printed on them, numbered 1-3.
4. 15 strips of paper with the survey questions printed on them, numbered 11-26.

Directions:

Enclosed in the envelope you will find 3 domains and 15 survey questions numbered from 11-26. You will take each domain and lay them in front of you. You will then take the 15 survey questions and place them with the related domain. Once you have done this, take your domains and the questions you have chosen to go with that domain and paperclip them together. Once you have done this place each one in the envelope provided and return them to me, Jannie Jordan, Department of Education Foundations Leadership and Technology, Doctoral Candidate.

APPENDIX E: IRB Approved Site Locations

Southeastern Alabama Teachers

1. Alexander City Board of Education

   School: Alexander City Middle School

   359 State Street

   Alexander City, AL 35010

   Teachers: 86

   Students: 646

   Student Diversity: 62% White, 36% Black, 2% Hispanics, and 0% other.

2. Russell County Board of Education

   School: Russell County Middle School

   Post Office Box 400

   Phenix City, AL 36868

   Teachers: 70

   Students: 665

Student Diversity: 55% White 38% Black, 3% Hispanics, 2% Asian, and 1% other. Bullock County School District, Union Springs, AL

3. Bullock County Board of Education

   School: South Highland Middle School

   108 Hardaway Avenue West

   Post Office Box 231

   Union Springs, AL 36089 – 0231

   Teachers: 66

   Students: 440

   Student Diversity: 91% Black, 8% Hispanics, 1% White, and 0% Other.

4. Jefferson County Board of Education

   School: Erwin Middle School

   2100 18th Street South

   Birmingham, AL 35209 – 1891

   Teachers: 90

   Students: 675

   Student Diversity: 94% Black, 3% Hispanics, 1% White, and 1% Other.

APPENDIX F: SPSS Coding Plots

Gender

		Value	Count	Percent
Standard Attributes	Position	1		
	Label	<none>		
	Type	Numeric		
	Format	F6		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Male	39	51.3%
	2	Female	37	48.7%

Age

		Value
Standard Attributes	Position	2
	Label	<none>
	Type	Numeric
	Format	F3
	Measurement	Scale
	Role	Input
N	Valid	76
	Missing	0
Central Tendency and Dispersion	Mean	41.17
	Standard Deviation	7.703
	Percentile 25	36.50
	Percentile 50	41.00
	Percentile 75	47.00

Race

		Value	Count	Percent
Standard Attributes	Position	3		
	Label	<none>		
	Type	Numeric		
	Format	F4		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	White	34	44.7%
	2	African American	17	22.4%
	3	Asian	7	9.2%
	4	Hispanic	7	9.2%
	5	Native American	0	0.0%
	6	Other	10	13.2%
	9		1	1.3%

Years of Teaching

		Value
Standard Attributes	Position	4
	Label	<none>
	Type	Numeric
	Format	F5
	Measurement	Scale
	Role	Input
N	Valid	76
	Missing	0
Central Tendency and Dispersion	Mean	9.87
	Standard Deviation	4.349
	Percentile 25	7.00
	Percentile 50	10.00
	Percentile 75	12.00

Grade Level

		Value	Count	Percent
Standard Attributes	Position	5		
	Label	<none>		
	Type	Numeric		
	Format	F5		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	6th	11	14.5%
	2	7th	21	27.6%
	3	8th	44	57.9%

PT_Teach

		Value	Count	Percent
Standard Attributes	Position	6		
	Label	<none>		
	Type	Numeric		
	Format	F5		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	16	21.1%
	2	No	60	78.9%

PT_Integrate

		Value	Count	Percent
Standard Attributes	Position	7		
	Label	<none>		
	Type	Numeric		
	Format	F9		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	76	100.0%
	2	No	0	0.0%

PT_Ever Used

		Value	Count	Percent
Standard Attributes	Position	8		
	Label	<none>		
	Type	Numeric		
	Format	F4		
	Measurement	Nominal		
	Role	Input		
Valid Values	1	Yes	76	100.0%
	2	No	0	0.0%

PT9_Use_PT

		Value	Count	Percent
Standard Attributes	Position	9		
	Label	<none>		
	Type	Numeric		
	Format	F10		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	1.01		
	Standard Deviation	.115		
	Percentile 25	1.00		
	Percentile 50	1.00		
	Percentile 75	1.00		
Labeled Values	1	Often	75	98.7%
	2	Sometimes	1	1.3%
	3	Rarely	0	0.0%
	4	Never	0	0.0%

Tech_Ins_Intre_11

		Value	Count	Percent
Standard Attributes	Position	11		
	Label	<none>		
	Type	Numeric		
	Format	F7		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	1.49		
	Standard Deviation	.529		
	Percentile 25	1.00		
	Percentile 50	1.00		
	Percentile 75	2.00		
Labeled Values	1	Strongly Agree	40	52.6%
	2	Agree	35	46.1%
	3	Disagree	1	1.3%
	4	Strongly Disagree	0	0.0%
	5	Do not know	0	0.0%

Tech_Ins_Intre_12

		Value	Count	Percent
Standard Attributes	Position	12		
	Label	<none>		
	Type	Numeric		
	Format	F9		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	1.92		
	Standard Deviation	.648		
	Percentile 25	2.00		
	Percentile 50	2.00		
	Percentile 75	2.00		
Labeled Values	1	Strongly Agree	15	19.7%
	2	Agree	56	73.7%
	3	Disagree	1	1.3%
	4	Strongly Disagree	4	5.3%
	5	Do not know	0	0.0%

Tech_Ins_Intre_13

		Value	Count	Percent
Standard Attributes	Position	13		
	Label	<none>		
	Type	Numeric		
	Format	F8		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	2.20		
	Standard Deviation	.910		
	Percentile 25	2.00		
	Percentile 50	2.00		
	Percentile 75	3.00		
Labeled Values	1	Strongly Agree	16	21.1%
	2	Agree	38	50.0%
	3	Disagree	13	17.1%
	4	Strongly Disagree	9	11.8%
	5	Do not know	0	0.0%

Tech_Ins_Intre_15

		Value	Count	Percent
Standard Attributes	Position	15		
	Label	<none>		
	Type	Numeric		
	Format	F14		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	3.42		
	Standard Deviation	.548		
	Percentile 25	3.00		
	Percentile 50	3.00		
	Percentile 75	4.00		
Labeled Values	1	Strongly Agree	0	0.0%
	2	Agree	2	2.6%
	3	Disagree	40	52.6%
	4	Strongly Disagree	34	44.7%
	5	Do not know	0	0.0%

Tech_Ins_Intre_16

		Value	Count	Percent
Standard Attributes	Position	16		
	Label	<none>		
	Type	Numeric		
	Format	F6		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	3.08		
	Standard Deviation	1.364		
	Percentile 25	3.00		
	Percentile 50	3.00		
	Percentile 75	3.00		
Labeled Values	1	Strongly Agree	1	1.3%
	2	Agree	9	11.8%
	3	Disagree	59	77.6%
	4	Strongly Disagree	6	7.9%
	5	Do not know	0	0.0%

Tech_Ins_Intre_17

		Value	Count	Percent
Standard Attributes	Position	17		
	Label	<none>		
	Type	Numeric		
	Format	F11		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	2.93		
	Standard Deviation	.789		
	Percentile 25	3.00		
	Percentile 50	3.00		
	Percentile 75	3.00		
Labeled Values	1	Strongly Agree	5	6.6%
	2	Agree	10	13.2%
	3	Disagree	47	61.8%
	4	Strongly Disagree	13	17.1%
	5	Do not know	1	1.3%

Tech_Ins_Intre_19

		Value	Count	Percent
Standard Attributes	Position	19		
	Label	<none>		
	Type	Numeric		
	Format	F10		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	1.75		
	Standard Deviation	.520		
	Percentile 25	1.00		
	Percentile 50	2.00		
	Percentile 75	2.00		
Labeled Values	1	Strongly Agree	22	28.9%
	2	Agree	51	67.1%
	3	Disagree	3	3.9%
	4	Strongly Disagree	0	0.0%
	5	Do not know	0	0.0%

Tech_Ins_Intre_21

		Value	Count	Percent
Standard Attributes	Position	21		
	Label	<none>		
	Type	Numeric		
	Format	F12		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	3.00		
	Standard Deviation	.712		
	Percentile 25	3.00		
	Percentile 50	3.00		
	Percentile 75	3.00		
Labeled Values	1	Strongly Agree	2	2.6%
	2	Agree	13	17.1%
	3	Disagree	44	57.9%
	4	Strongly Disagree	17	22.4%
	5	Do not know	0	0.0%

Tech_Ins_Intre_22

		Value	Count	Percent
Standard Attributes	Position	22		
	Label	<none>		
	Type	Numeric		
	Format	F11		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	3.07		
	Standard Deviation	.718		
	Percentile 25	3.00		
	Percentile 50	3.00		
	Percentile 75	3.50		
Labeled Values	1	Strongly Agree	1	1.3%
	2	Agree	13	17.1%
	3	Disagree	43	56.6%
	4	Strongly Disagree	18	23.7%
	5	Do not know	1	1.3%

Tech_Ins_Intre_23

		Value	Count	Percent
Standard Attributes	Position	23		
	Label	<none>		
	Type	Numeric		
	Format	F9		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	2.24		
	Standard Deviation	.936		
	Percentile 25	2.00		
	Percentile 50	2.00		
	Percentile 75	3.00		
Labeled Values	1	Strongly Agree	16	21.1%
	2	Agree	35	46.1%
	3	Disagree	17	22.4%
	4	Strongly Disagree	7	9.2%
	5	Do not know	1	1.3%

Tech_Ins_Intre_24

		Value	Count	Percent
Standard Attributes	Position	24		
	Label	<none>		
	Type	Numeric		
	Format	F7		
	Measurement	Scale		
	Role	Input		
N	Valid	76		
	Missing	0		
Central Tendency and Dispersion	Mean	1.84		
	Standard Deviation	.634		
	Percentile 25	1.50		
	Percentile 50	2.00		
	Percentile 75	2.00		
Labeled Values	1	Strongly Agree	19	25.0%
	2	Agree	52	68.4%
	3	Disagree	4	5.3%
	4	Strongly Disagree	0	0.0%
	5	Do not know	1	1.3%

Tech_Ins_Intre_25

		Value	Count	Percent
Standard Attributes	Position	25		
	Label	<none>		
	Type	Numeric		
	Format	F7		
	Measurement	Scale		
	Role	Input		
N	Valid	75		
	Missing	1		
Central Tendency and Dispersion	Mean	1.79		
	Standard Deviation	.444		
	Percentile 25	2.00		
	Percentile 50	2.00		
	Percentile 75	2.00		
Labeled Values	1	Strongly Agree	17	22.4%
	2	Agree	57	75.0%
	3	Disagree	1	1.3%
	4	Strongly Disagree	0	0.0%
	5	Do not know	0	0.0%

APPENDIX G: RECRUITMENT SCRIPT

My name is Jannie Jordan, a graduate student from the Department of Educational Foundations, Leadership and Technology, at Auburn University. I would like to invite you to participate in my research study to examine the attitudes of teachers towards peer tutoring in technology instruction and integration. You may participate if you are 19 years of age or older, and are currently teaching a K-8 grade class. Please do not participate if you are not 19 years old.

As a participant, you will be asked to take a brief survey containing questions that will take approximately 5–10 minutes to complete. There are minimal risks involved with your participation in this survey. There are no benefits or compensation for your participation. There are no privacy issues related to participating in this survey, as no personal data will be collected.

If you think you would be willing to participate, please stay in the classroom and a survey and Information Letter telling you more about the study will be given to you. When you finish with the survey, please return it to me enclosed in the envelope provided.

Do you have any question? If you have questions later, please contact me at (706)577-7059, or you may contact my advisor, Dr. Maria Witte, at (334)844-3078. Thank you!

APPENDIX H: IRB Approval

Protocol approved, #11-279 EP 1109

Human Subjects (HSUBJEC@auburn.edu)

Fri 1/6/2012 5:38 PM

To: Jannie Jordan (jordajc@tigermail.auburn.edu)

Cc: Maria Witte (wittemm@auburn.edu); Sheri Downer (downesh@auburn.edu)
1 attachment:

Investigators Responsibilities rev 1-2011.docx;

Dear Ms. Jordan,

Your revisions to your protocol entitled "Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration" have been reviewed. Your protocol has now received final approval as "Expedited" under federal regulation 45 CFR 46.110(7).

Official notice:
This e-mail serves as official notice that your protocol has been approved. A formal approval letter will not be sent unless you notify us that you need one. By accepting this approval, you also accept your responsibilities associated with this approval. Details of your responsibilities are attached. Please print and retain.

Consent document:
Your approved, stamped information letter will soon be ready for pickup. If we don't hear from you in a few days, we'll forward by campus mail.

Please note that *you may not begin your research that involves human subjects until you receive the information letter* with an IRB approval stamp applied. You must use copies of that document when you consent participants, and provide a copy for them to keep.

Expiration:
Your protocol will **expire on September 24, 2012**. Put that date on your calendar now. About three weeks before that time you will need to submit a final report or renewal request. (You might send yourself a delayed e-mail reminder for early next September.)
If you have any questions, please let us know.
Best wishes for success with your research!
Susan
Susan Anderson, IRB Administrator
IRB / Office of Research Compliance
115 Ramsay Hall (basement) **** NOTE NEW ADDRESS ****
Auburn University, AL 36849
(334) 844-5966 hsubjec@auburn.edu

READ, PRINT AND RETAIN THIS DOCUMENT

The Auburn University Institutional Review Board
Office of Research Compliance – Human Subjects
307 Samford Hall
334-844-5966, fax 334-844-4391, hsubjec@auburn.edu

Investigators: By accepting this IRB approval for this protocol, you agree to the following:

1. No participants may be recruited or involved in any study procedure prior to the IRB approval date or after the expiration date. (PIs and sponsors are responsible for initiating Continuing Review proceedings via a renewal request or submission of a final report.)

2. ***All protocol modifications*** will be approved in advance by submitting a modification request to the IRB unless they are intended to reduce immediate risk. Modifications that must be approved include adding/changing sites for data collection, adding key personnel, and altering any method of participant recruitment or data collection. Any change in your research purpose or research objectives should also be approved and noted in your IRB file. The use of any unauthorized procedures may result in notification to your sponsoring agency, suspension of your study, and/or destruction of data.

3. ***Adverse events or unexpected problems*** involving participants will be *reported within 5 days* to the IRB.

4. A ***renewal*** request, if needed, will be submitted three to four weeks before your protocol expires.

5. A ***final report*** will be submitted when you complete your study, and before expiration. Failure to submit your final report may result in delays in review and approval of subsequent protocols.

6. ***Expiration*** – If the protocol expires without contacting the IRB, the protocol will be administratively closed. The project will be *suspended* and you will need to submit a new protocol to resume your research.

7. ***Only the stamped, IRB-approved consent document or information letter will be used*** when consenting participants. Signed consent forms will be retained at least three years after completion of the study. Copies of consents without participant signatures andinformation letters will be kept to submit with the final report.

8. You will not receive a formal approval letter unless you request one. ***The e-mailed notification of approval to which this is attached serves as official notice.***

All forms can be found at http://www.auburn.edu/research/vpr/ohs/protocol.htm

APPENDIX I: CITI Training Certificate

CITI - Collaborative Institutional Training Initiative | Page 1 of 1

Jannie Jordan ID: 1819374 | Log Out | Help
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Main Menu My Profiles CE Credit Status My Reports Support

Main Menu > Previously Completed Coursework

Auburn University Reports

Course In The Protection Human Subjects

Non-AU Affiliated Key Personnel - Social and Behavioral Research

Stage	Completion Report #	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Completed Modules	Completion Report
Basic Course	4734417	80%	80%	08/05/2010	08/05/2010	08/04/2015	View	View

Records-Based Research

Stage	Completion Report #	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Completed Modules	Completion Report
Basic Course	6436470	80%	100%	08/02/2011	08/02/2011	07/31/2016	View	View

Researchin Public Elementary and Secondary Schools - SBR

Stage	Completion Report#	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Completed Modules	Completion Report
Basic Course	6436472	80%	100%	08/02/2011	08/02/2011	07/31/2016	View	View

Research with Protected Populations - Vulnerable Subjects: An Overview

Stage	Complet on Date Report #	Passing Score	Your Score	Start	Completion Date	Expiration Date	Completed Modules	Completion Report
Basic Course	6436471	80%	100%	08/02/2011	08/02/2011	07/31/2016	View	View

Research with Students - SBR

Stage	Completion Report #	Passing Score	Your Score	Start Date	Completion Date	Expiration Date	Completed Modules	Completion Report
Basic Course	6436474	80%	90%	08/01/2011	08/02/2011	07/31/2016	View	View

Workers as Research Subjects - A Vulnerable Population

Stage	Completion Date Report #	Passing Score	Your Score	Start	Completion Date	Expiration Date	Completed Modules	Completion Report
Basic Course	6436473	80%	100%	08/02/2011	08/02/2011	07/31/2016	View	View

APPENDIX J: Information Letter

AUBURN UNIVERSITY

COLLEGE OF EDUCATION

EDUCATIONAL FOUNDATIONS, LEADERSHIP AND TECHNOLOGY

INFORMATION LETTER

for a Research Study entitled

Attitudes of Teachers Towards Peer Tutoring in Technology Instruction and Integration

You are invited to participate in a research study to determine teachers' attitude towards peer tutoring in technology instruction and integration. The study is being conducted by Jannie C. Jordan, Principal Investigator, under the direction of Dr. Maria Witte, Committee Chairperson in the Auburn University Department of Education Foundations Leadership and Technology. You were selected as a possible participant because you are a teacher who teaches sixth, seventh and eighth graders and are age 19 or older. During an in-service meeting you will be provided with background information in reference to the purpose of this study.

What will be involved if you participate? If you decide to participate in this research study, you will be provided with a packet of information, to include an Information letter, and a Survey which includes questions that pertain to your attitude towards peer tutoring in technology instruction and integration. You will be asked to return the completed survey to me at the end of the in-service meeting. You will also be provided an opportunity to ask questions. Your total time commitment will be approximately 10-15 minutes.

Are there any risks or discomforts? The risks associated with participating in this study are minimal. To minimize these risks, we will keep data anonymous and no deception will be used.

Are there any benefits to yourself or others? Although there are no direct benefits for you if you choose to participate in this study, we hope the results of this study will impact you positively. You can expect to become aware of classroom environmental enhancements to students' learning. You will also become instrumental in providing feedback to develop a program that encourages students to take risks, make mistakes and ultimately learn and understand new concepts. We/I cannot promise you that you will receive any or all of the benefits described.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Educational Foundations Leadership and Technology, or the Alabama State Department of Education.

Your privacy will be protected. Any information obtained in connection with this study will remain anonymous. Neither your name, nor any other identifying information will be collected on the survey, and you will not be asked for identifying information at any other time during your participation in this study. Information obtained through your participation may be used for data analysis only and will be kept with the Principal Investigator and the Committee chairperson. The Principal Investigator may use the data analysis in fulfillment of educational requirements and data may be published in a professional journal, or presented at professional meetings.

If you have questions about this study, please ask them now or contact Jannie Jordan at (706) 577- 7059, or Dr. Maria Witte at (334) 844-3078. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844- 5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. IF YOU DECIDE TO PARTICIPATE, THE DATA YOU PROVIDE WILL SERVE AS YOUR AGREEMENT TO DO SO. THIS LETTER IS YOURS TO KEEP.

____

Investigator's Signature Date

____

Printed Name

APPENDIX K: SPSS Frequency Tables

```
Output per question 1-25.
GET

FILE='C:\Users\rcmstfadmin\Documents\FW  Survey_Data_for_Peer_Tutoring_&
_Dictionary-Jannie_Jordan_EFLT\RecodedDataJannieJordan.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
FREQUENCIES VARIABLES=Tech_Ins_Intre_11 Tech_Ins_Intre_12
Tech_Ins_Intre_13 Tech_Ins_Intre_14 Tech_Ins_Intre_15 Tech_Ins_Intre_16
Tech_Ins_Intre_17 Tech_Ins_Intre_18 Tech_Ins_Intre_19 Tech_Ins_Intre_20
Tech_Ins_Intre_21 Tech_Ins_Intre_22 Tech_Ins_Intre_23 Tech_Ins_Intre_24
Tech_Ins_Intre_25
  /STATISTICS=STDDEV MEAN
  /HISTOGRAM NORMAL
  /ORDER=VARIABLE.
```

Frequencies

```
[DataSet1]
C:\Users\rcmstfadmin\Documents\FW  Survey_Data_for_Peer_Tutoring_&_Dicti
onary-Jannie_Jordan_EFLT\RecodedDataJannieJordan.sav
```

Tech_Ins_Intre_11

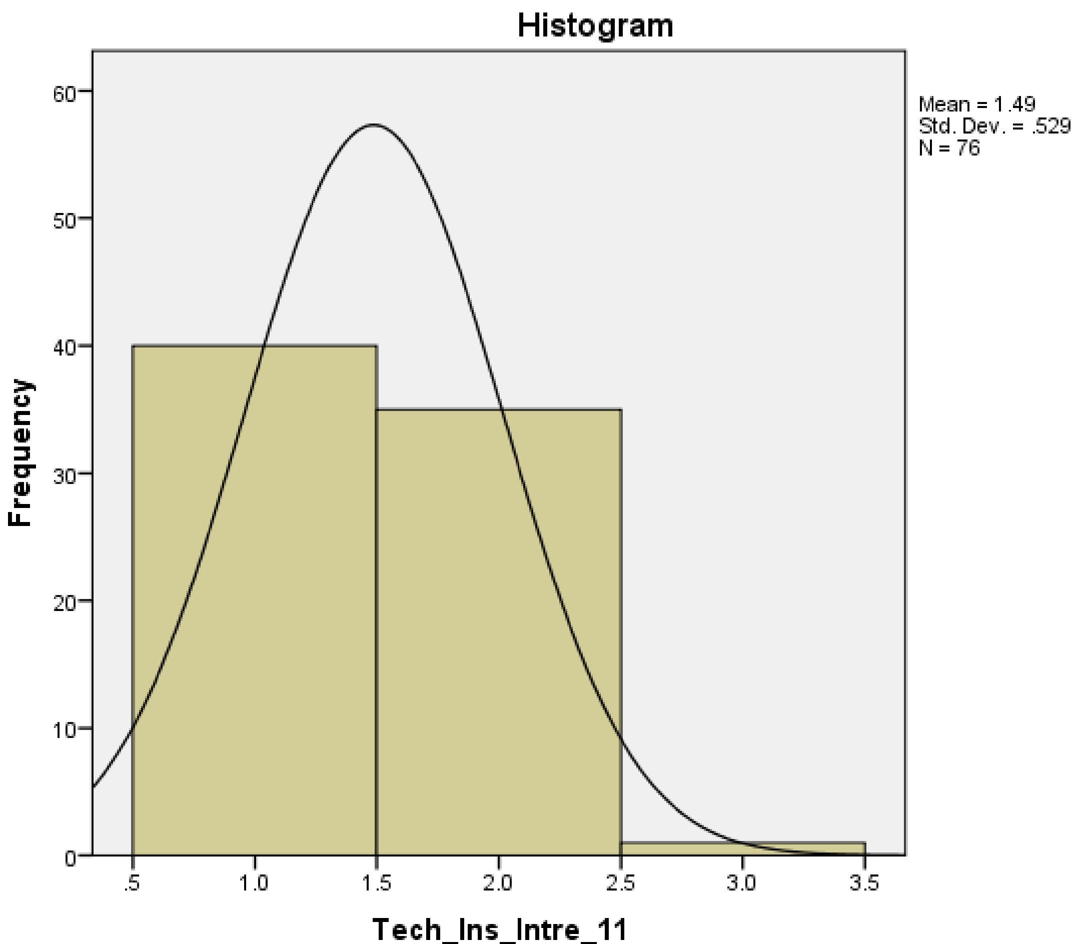
Statistics

Tech_Ins_Intre_11

N	Valid	76
	Missing	0
Mean		1.49
Std. Deviation		.529

Tech_Ins_Intre_11

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	40	52.6	52.6	52.6
	Agree	35	46.1	46.1	98.7
	Disagree	1	1.3	1.3	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_12

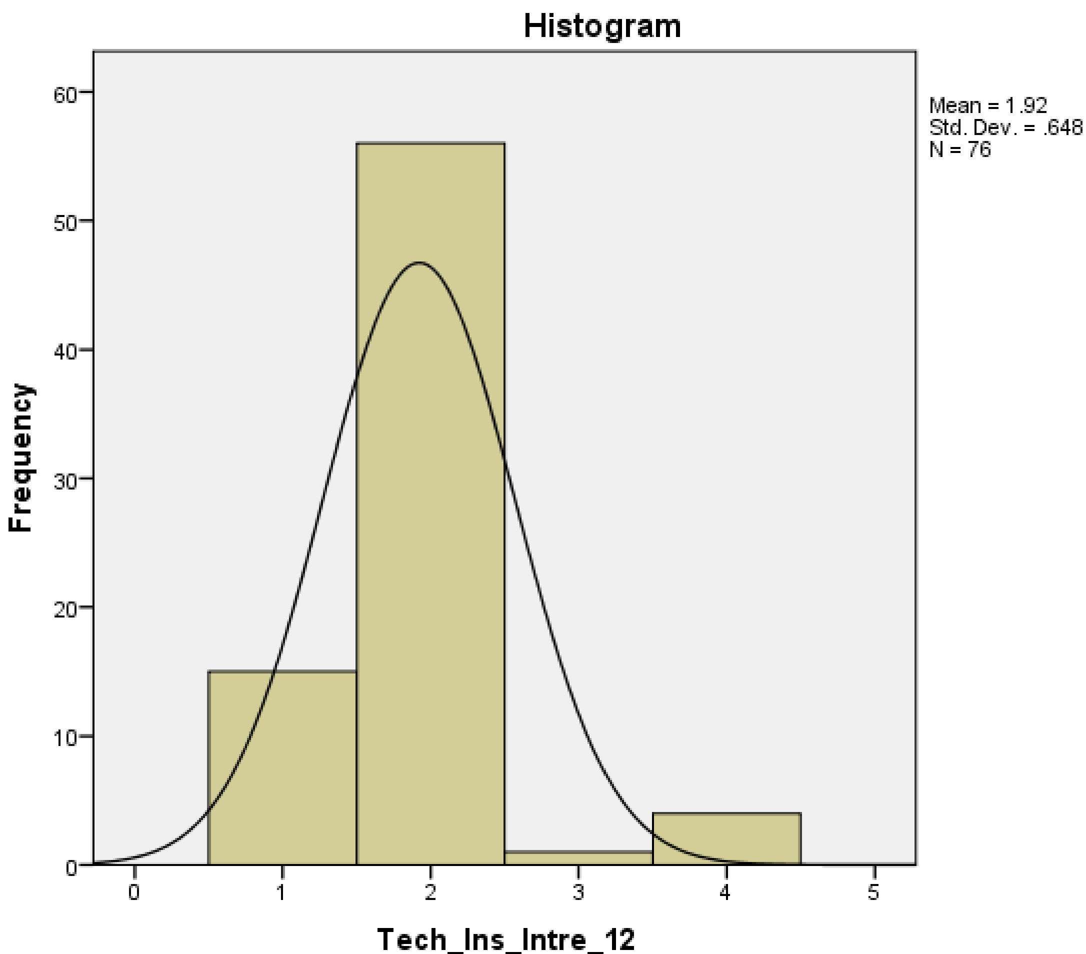
Statistics

Tech_Ins_Intre_12

N	Valid	76
	Missing	0
Mean		1.92
Std. Deviation		.648

Tech_Ins_Intre_12

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	15	19.7	19.7	19.7
	Agree	56	73.7	73.7	93.4
	Disagree	1	1.3	1.3	94.7
	Strongly Disagree	4	5.3	5.3	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_13

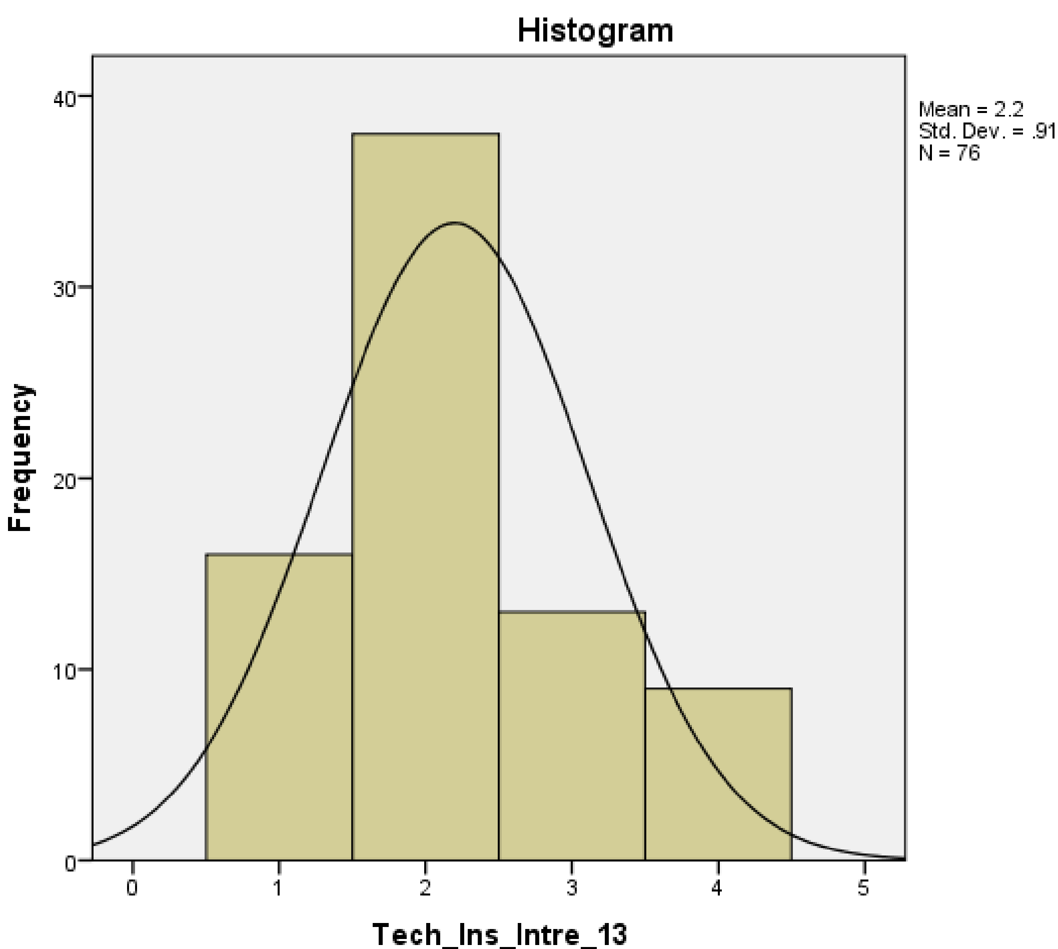
Statistics

Tech_Ins_Intre_13

N	Valid	76
	Missing	0
Mean		2.20
Std. Deviation		.910

Tech_Ins_Intre_13

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	16	21.1	21.1	21.1
	Agree	38	50.0	50.0	71.1
	Disagree	13	17.1	17.1	88.2
	Strongly Disagree	9	11.8	11.8	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_14

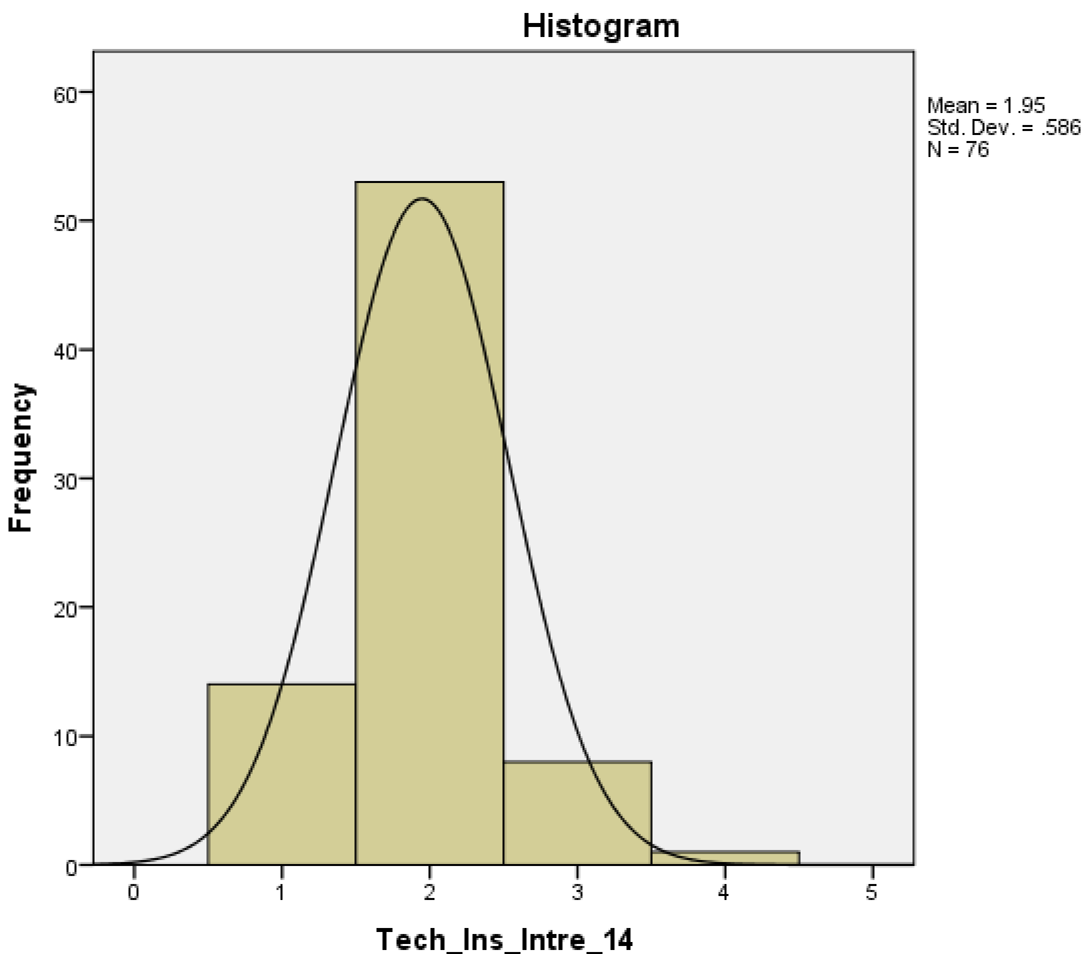
Statistics

Tech_Ins_Intre_14

N	Valid	76
	Missing	0
Mean		1.95
Std. Deviation		.586

Tech_Ins_Intre_14

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	14	18.4	18.4	18.4
	Agree	53	69.7	69.7	88.2
	Disagree	8	10.5	10.5	98.7
	Strongly Disagree	1	1.3	1.3	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_15

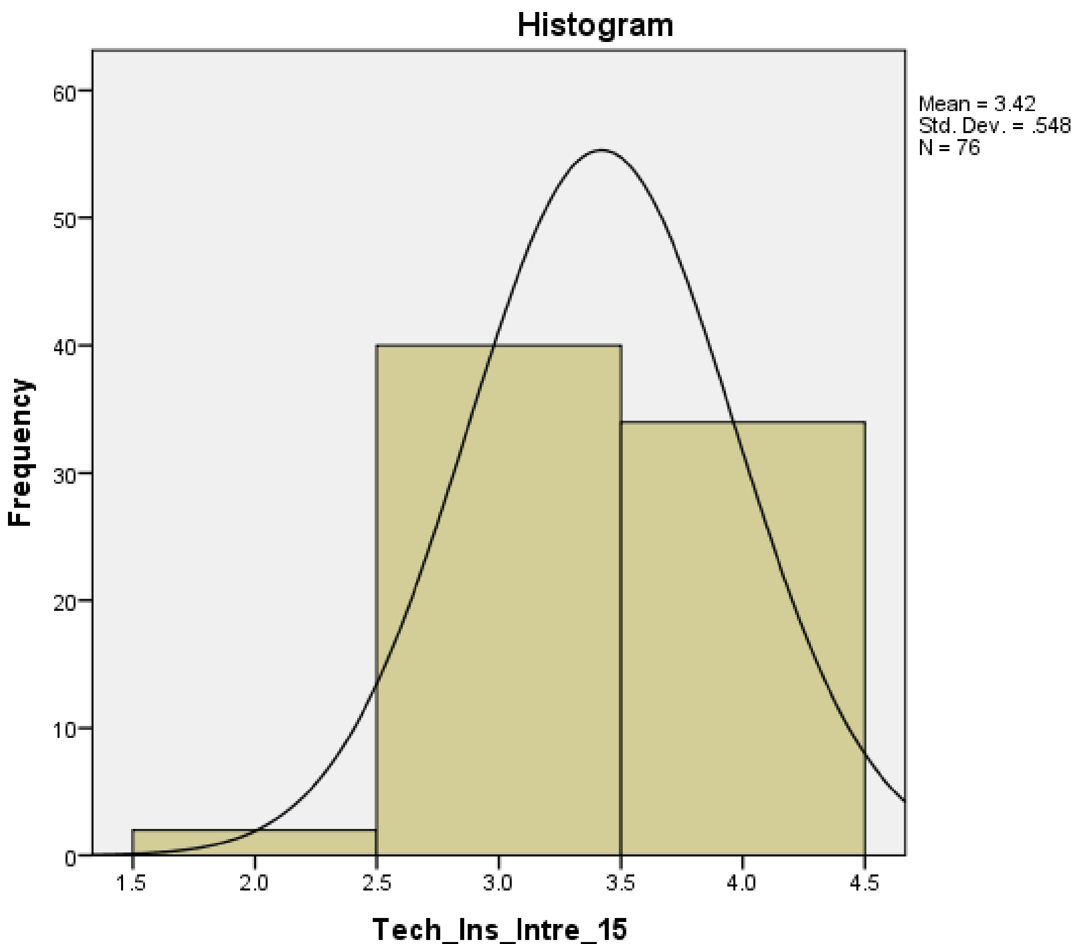
Statistics

Tech_Ins_Intre_15

N	Valid	76
	Missing	0
Mean		3.42
Std. Deviation		.548

Tech_Ins_Intre_15

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	2	2.6	2.6	2.6
	Disagree	40	52.6	52.6	55.3
	Strongly Disagree	34	44.7	44.7	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_16

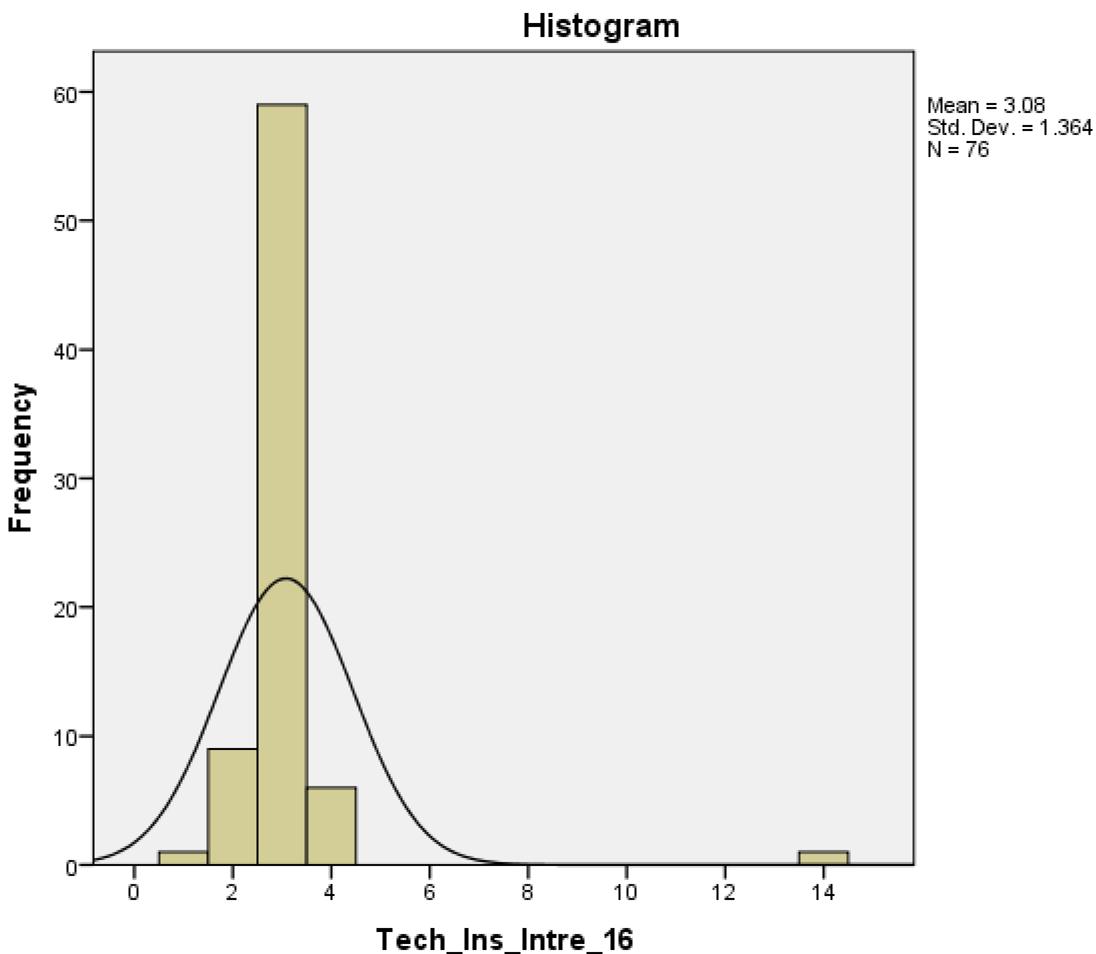
Statistics

Tech_Ins_Intre_16

N	Valid	76
	Missing	0
Mean		3.08
Std. Deviation		1.364

Tech_Ins_Intre_16

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	1	1.3	1.3	1.3
	Agree	9	11.8	11.8	13.2
	Disagree	59	77.6	77.6	90.8
	Strongly Disagree	6	7.9	7.9	98.7
	14	1	1.3	1.3	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_17

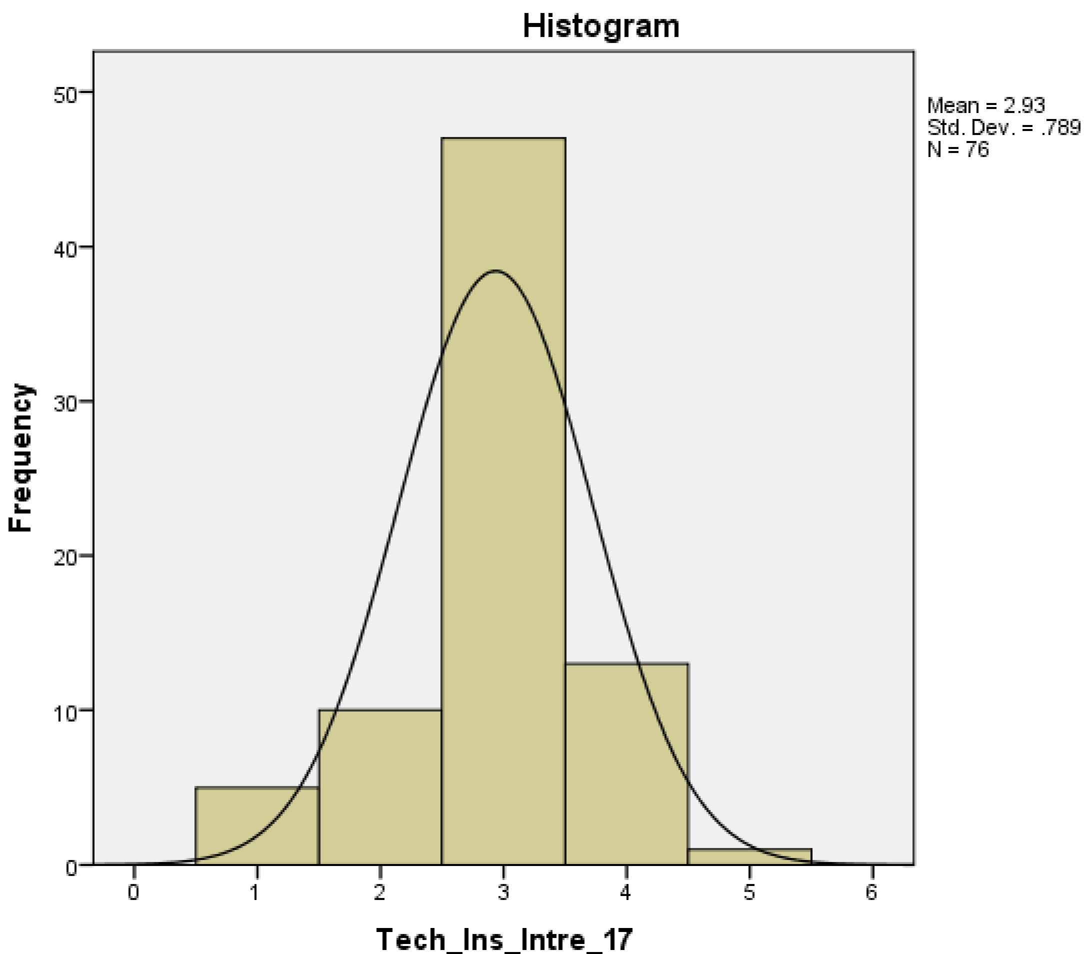
Statistics

Tech_Ins_Intre_17

N	Valid	76
	Missing	0
Mean		2.93
Std. Deviation		.789

Tech_Ins_Intre_17

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	5	6.6	6.6	6.6
	Agree	10	13.2	13.2	19.7
	Disagree	47	61.8	61.8	81.6
	Strongly Disagree	13	17.1	17.1	98.7
	Do not know	1	1.3	1.3	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_18

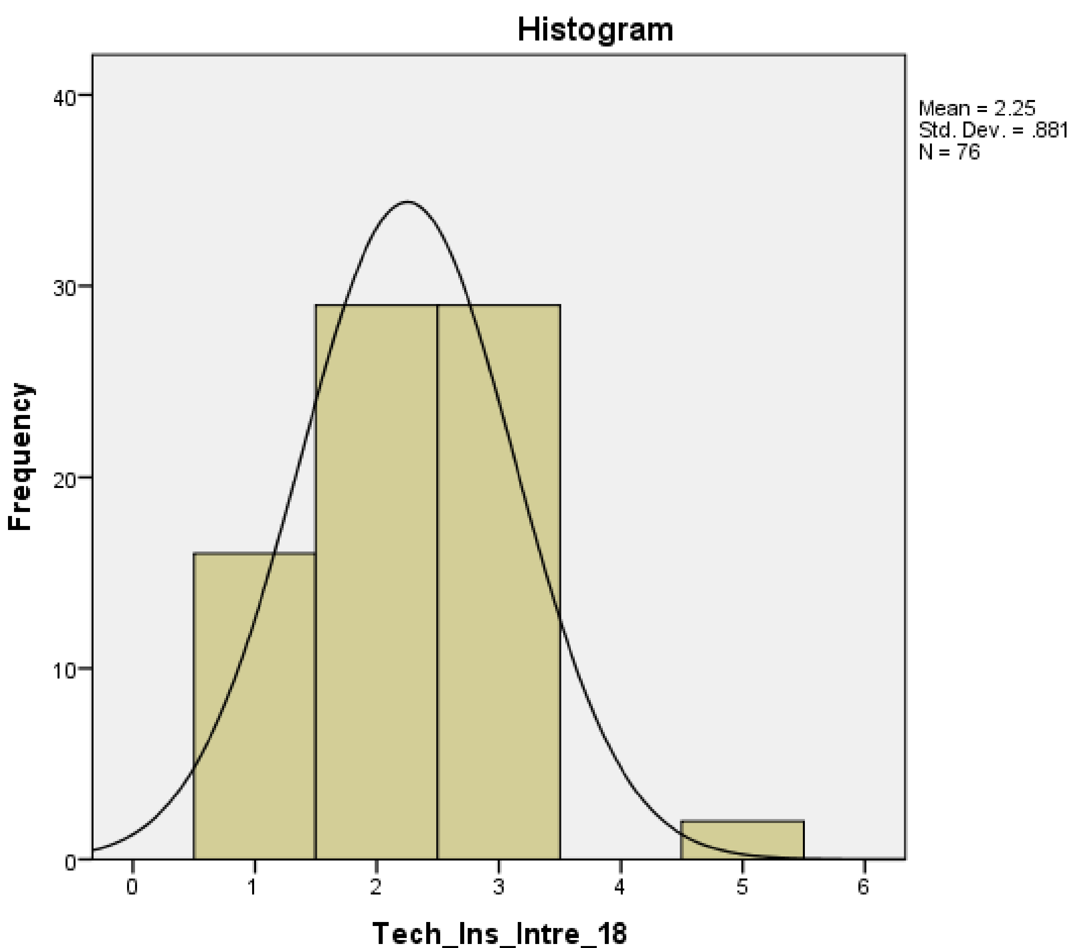
Statistics

Tech_Ins_Intre_18

N	Valid	76
	Missing	0
Mean		2.25
Std. Deviation		.881

Tech_Ins_Intre_18

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	16	21.1	21.1	21.1
	Agree	29	38.2	38.2	59.2
	Disagree	29	38.2	38.2	97.4
	Do not know	2	2.6	2.6	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_19

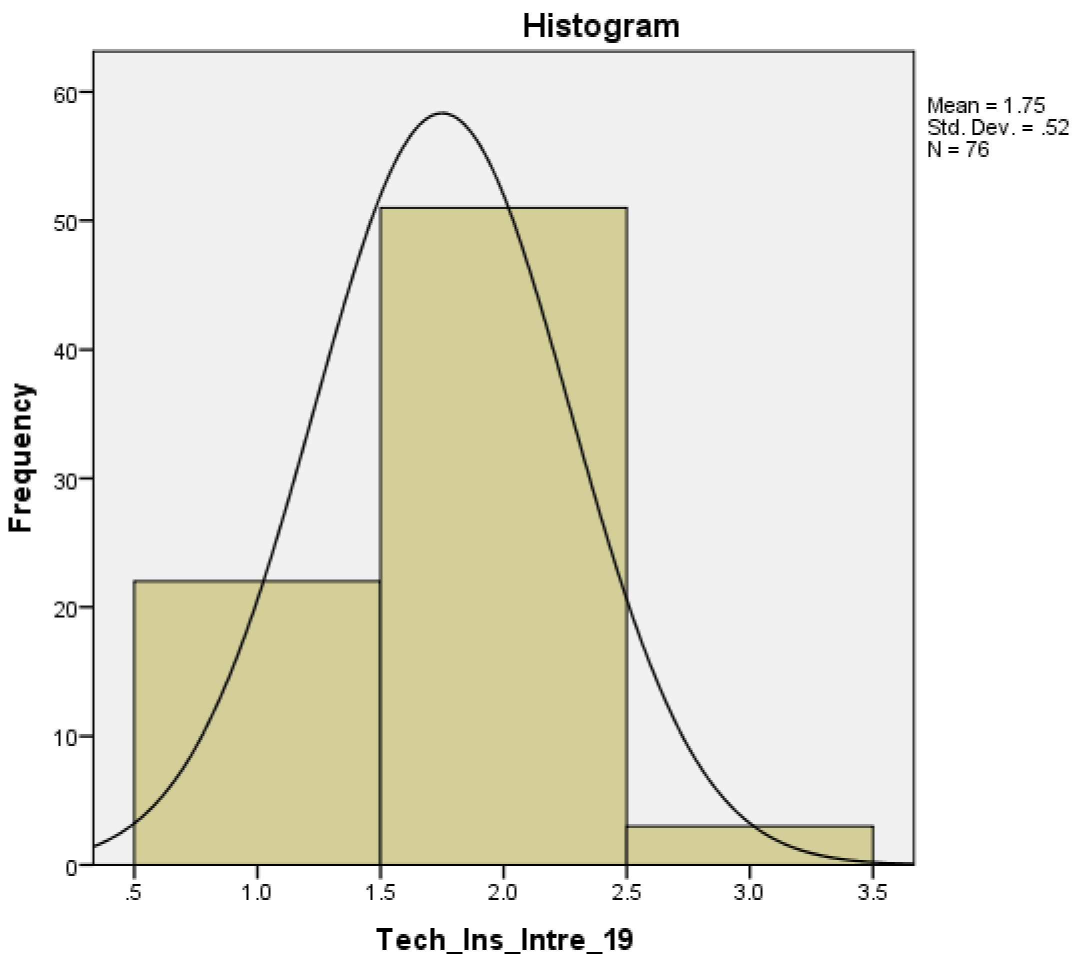
Statistics

Tech_Ins_Intre_19

N	Valid	76
	Missing	0
Mean		1.75
Std. Deviation		.520

Tech_Ins_Intre_19

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	22	28.9	28.9	28.9
	Agree	51	67.1	67.1	96.1
	Disagree	3	3.9	3.9	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_20

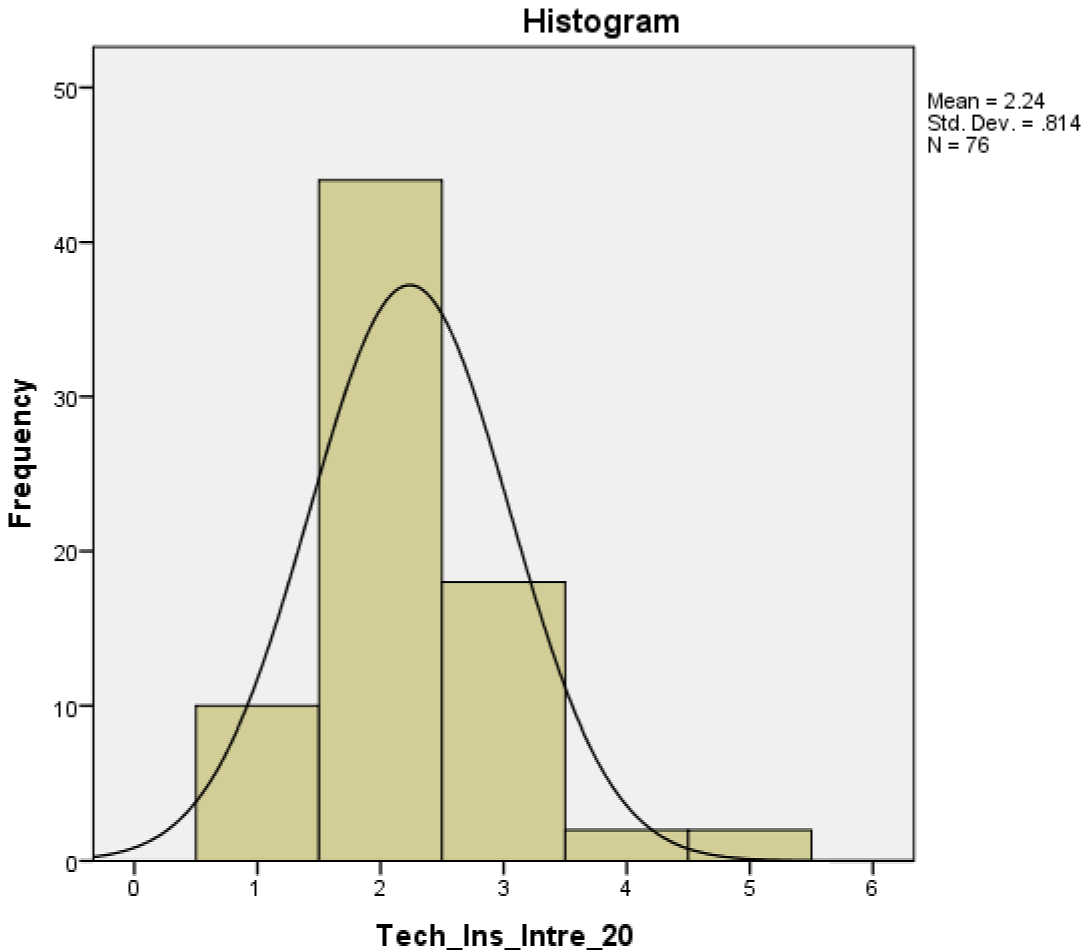
Statistics

Tech_Ins_Intre_20

N	Valid	76
	Missing	0
Mean		2.24
Std. Deviation		.814

Tech_Ins_Intre_20

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	10	13.2	13.2	13.2
	Agree	44	57.9	57.9	71.1
	Disagree	18	23.7	23.7	94.7
	Strongly Disagree	2	2.6	2.6	97.4
	Do not know	2	2.6	2.6	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_21

Statistics

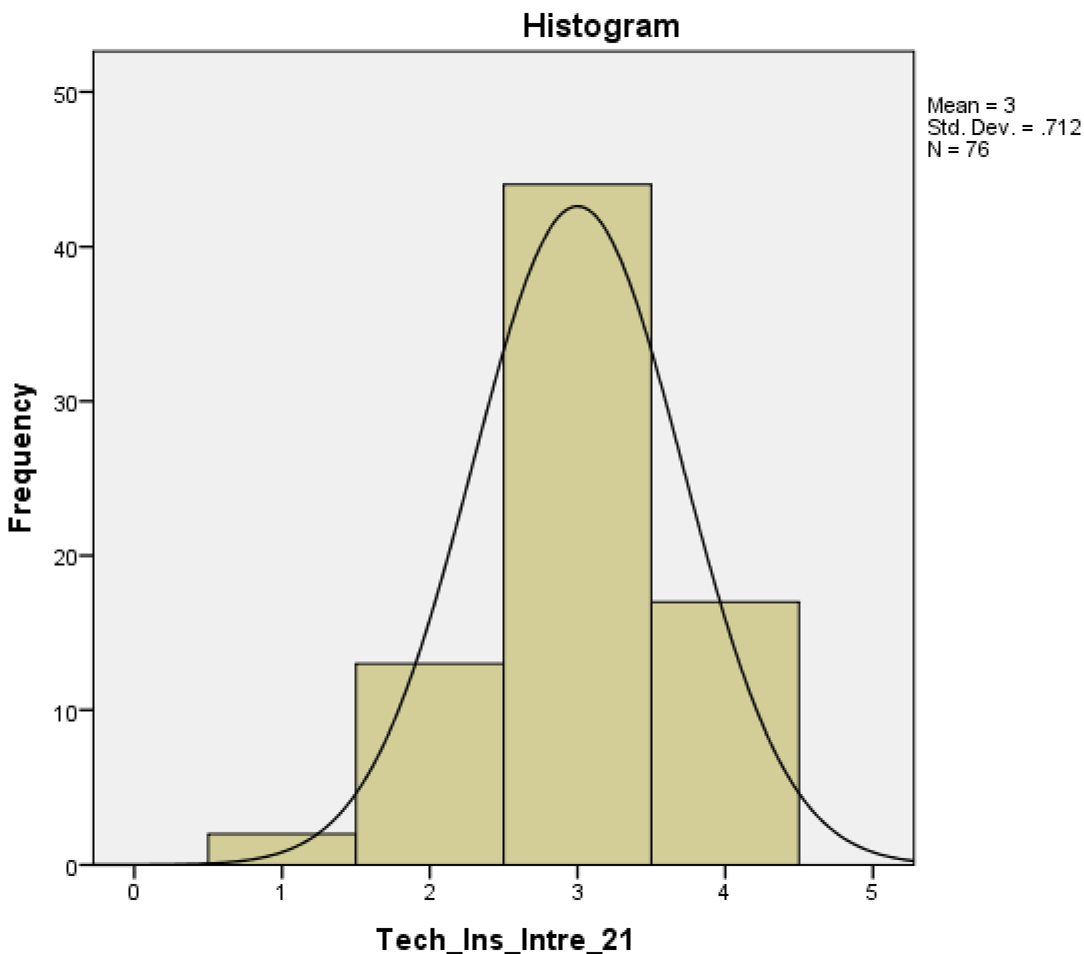
Tech_Ins_Intre_21

N	Valid	76
	Missing	0

Mean	3.00
Std. Deviation	.712

Tech_Ins_Intre_21

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	2	2.6	2.6	2.6
	Agree	13	17.1	17.1	19.7
	Disagree	44	57.9	57.9	77.6
	Strongly Disagree	17	22.4	22.4	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_22

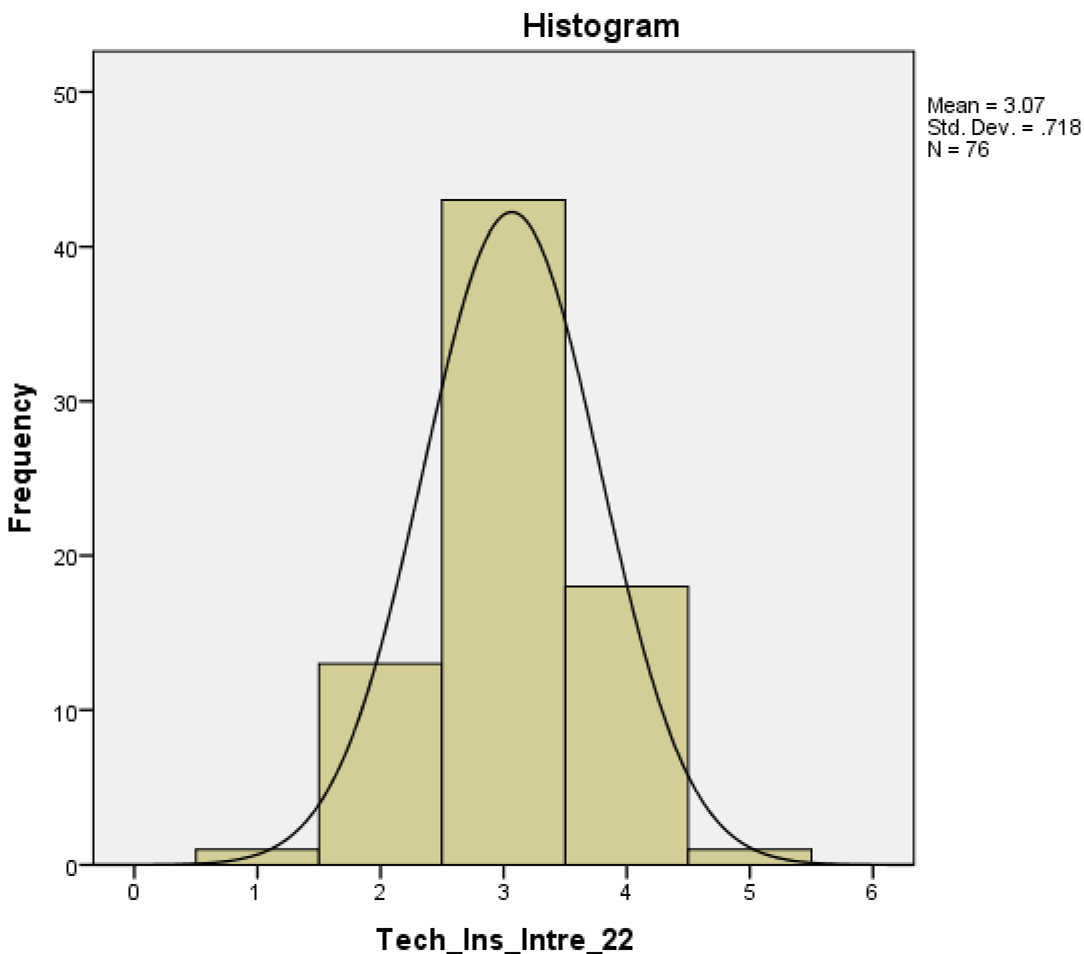
Statistics

Tech_Ins_Intre_22

N	Valid	76
	Missing	0
Mean		3.07
Std. Deviation		.718

Tech_Ins_Intre_22

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	1	1.3	1.3	1.3
	Agree	13	17.1	17.1	18.4
	Disagree	43	56.6	56.6	75.0
	Strongly Disagree	18	23.7	23.7	98.7
	Do not know	1	1.3	1.3	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_23

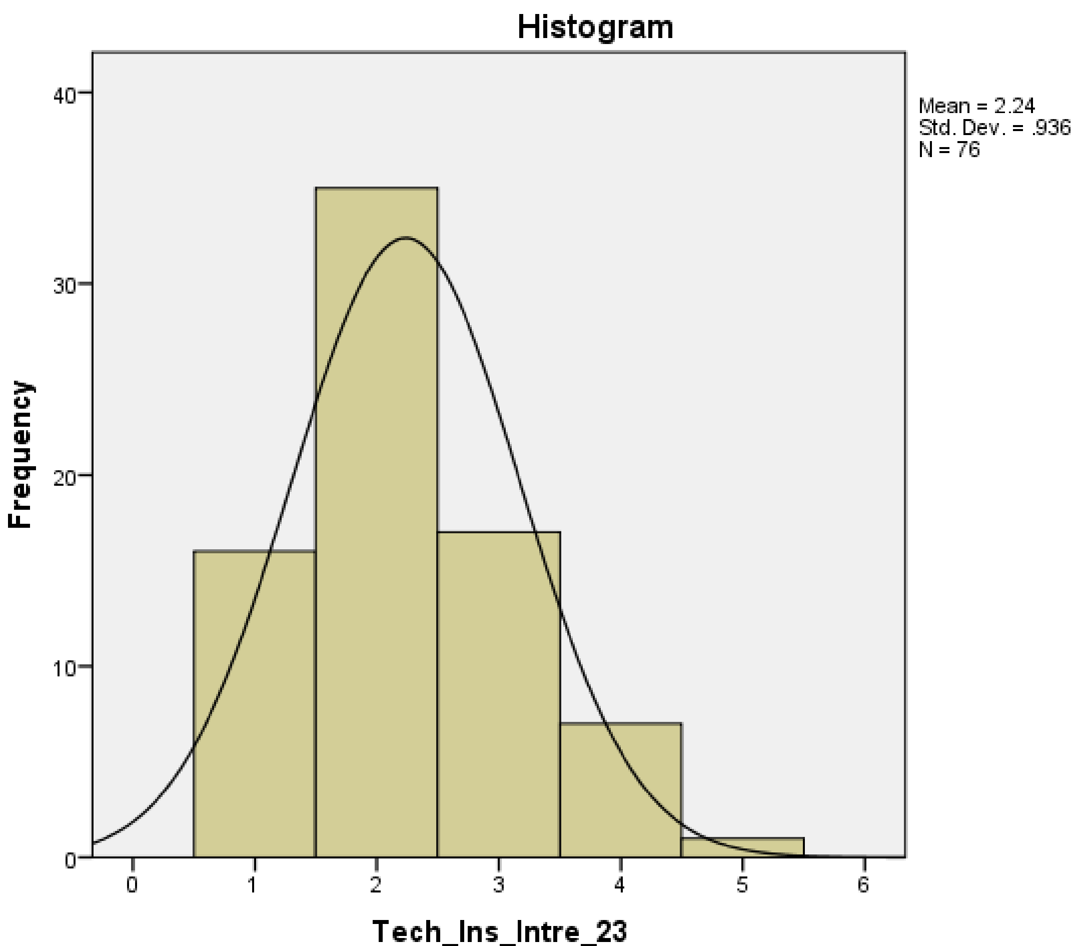
Statistics

Tech_Ins_Intre_23

N	Valid	76
	Missing	0
Mean		2.24
Std. Deviation		.936

Tech_Ins_Intre_23

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	16	21.1	21.1	21.1
	Agree	35	46.1	46.1	67.1
	Disagree	17	22.4	22.4	89.5
	Strongly Disagree	7	9.2	9.2	98.7
	Do not know	1	1.3	1.3	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_24

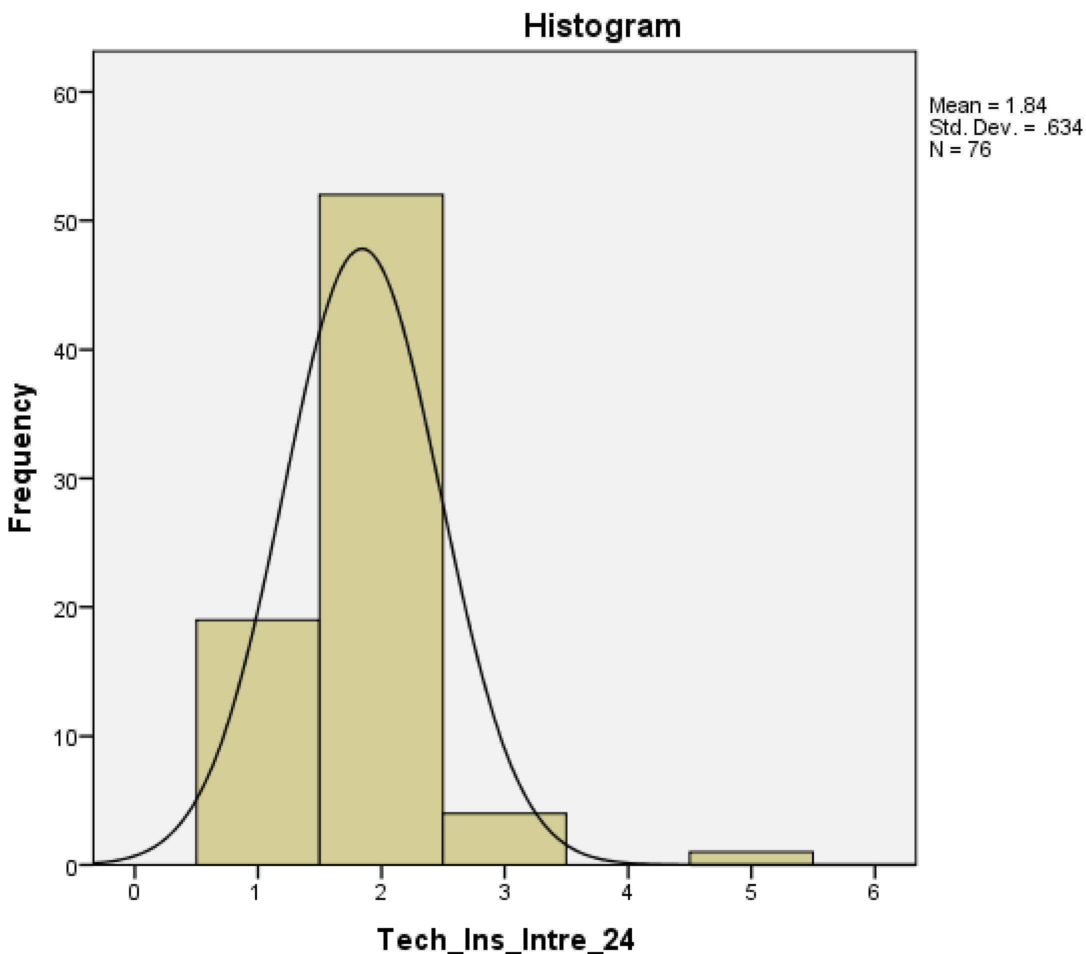
Statistics

Tech_Ins_Intre_24

N	Valid	76
	Missing	0
Mean		1.84
Std. Deviation		.634

Tech_Ins_Intre_24

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	19	25.0	25.0	25.0
	Agree	52	68.4	68.4	93.4
	Disagree	4	5.3	5.3	98.7
	Do not know	1	1.3	1.3	100.0
	Total	76	100.0	100.0	



Tech_Ins_Intre_25

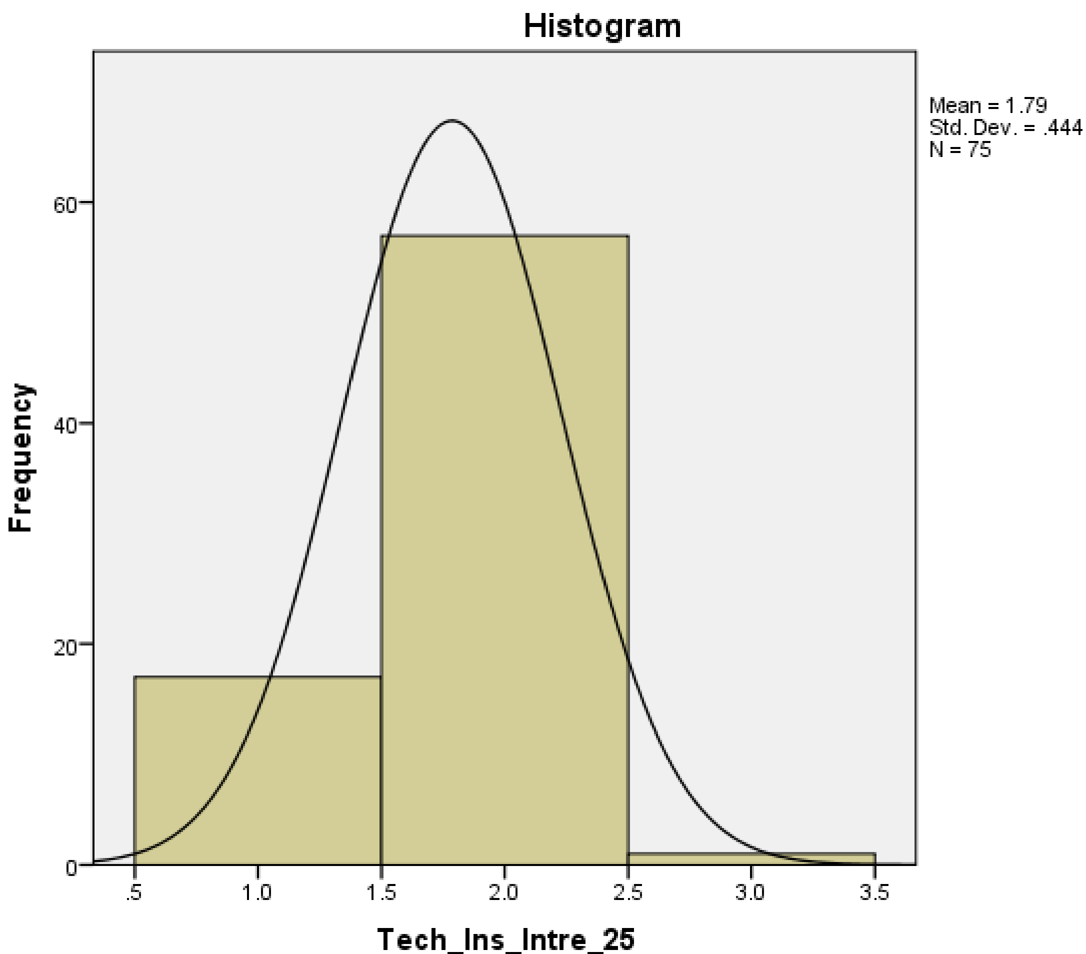
Statistics

Tech_Ins_Intre_25

N	Valid	75
	Missing	1
Mean		1.79
Std. Deviation		.444

Tech_Ins_Intre_25

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	17	22.4	22.7	22.7
	Agree	57	75.0	76.0	98.7
	Disagree	1	1.3	1.3	100.0
	Total	75	98.7	100.0	
Missing	System	1	1.3		
Total		76	100.0		



Descriptives

[DataSet1]
C:\Users\rcmstfadmin\Documents\FW Survey_Data_for_Peer_Tutoring_&_Dictionary-Jannie_Jordan_EFLT\RecodedDataJannieJordan.sav

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation

Gender	76	1	2	1.49	.503
Age	76	26	58	41.17	7.703
Race	76	1	9	2.45	1.872
YearsofTeaching	76	2	24	9.87	4.349
GradeLevel	76	1	3	2.43	.736
Valid N (listwise)	76				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Gender	76	1	2	1.49	.503
Age	76	26	58	41.17	7.703
Race	76	1	9	2.45	1.872
YearsofTeaching	76	2	24	9.87	4.349
GradeLevel	76	1	3	2.43	.736
PT_Teach	76	1	2	1.79	.410
PT_Integrate	76	1	1	1.00	.000
Valid N (listwise)	76				

Tech_Ins_Intre_11

Gender

Case Processing Summary

	Gender	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Tech_Ins_Intre_11	Male	39	100.0%	0	0.0%	39	100.0%
	Female	37	100.0%	0	0.0%	37	100.0%

Descriptives

	Gender			Statistic	Std. Error	Bootstrap[a]			
						Bias	Std. Error	95% Confidence Interval	
								Lower	Upper
Tech_Ins_Intre_11	Male	Mean		1.49	.081	.00	.06	1.38	1.61
		95% Confidence Interval for Mean	Lower Bound	1.32					
			Upper Bound	1.65					
		5% Trimmed Mean		1.49		.00	.06	1.37	1.62
		Median		1.00		.41	.47	1.00	2.00
		Variance		.256		-.003	.005	.242	.258
		Std. Deviation		.506		-.003	.005	.492	.508
		Minimum		1					
		Maximum		2					
		Range		1					
		Interquartile Range		1		0	0	1	1
		Skewness		.053	.378	-.009	.239	-.449	.494
		Kurtosis		-2.108	.741	.057	.114	-2.135	-1.831
	Female	Mean		1.49	.092	.00	.06	1.37	1.61
		95% Confidence Interval for Mean	Lower Bound	1.30					
			Upper Bound	1.67					
		5% Trimmed Mean		1.45		.00	.07	1.32	1.58
		Median		1.00		.24	.41	1.00	2.00

	Variance	.312		-.003	.009	.292	.328
	Std. Deviation	.559		-.003	.008	.540	.572
	Minimum	1					
	Maximum	3					
	Range	2					
	Interquartile Range	1		0	0	1	1
	Skewness	.560	.388	.018	.256	.131	1.162
	Kurtosis	-.750	.759	.111	.400	-1.034	.423

a. Unless otherwise noted, bootstrap results are based on 1000 stratified bootstrap samples

Age

Case Processing Summary

	Age	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Tech_Ins_Intre_11	26	2	100.0%	0	0.0%	2	100.0%
	27	4	100.0%	0	0.0%	4	100.0%
	29	3	100.0%	0	0.0%	3	100.0%
	30	4	100.0%	0	0.0%	4	100.0%
	35	4	100.0%	0	0.0%	4	100.0%
	36	2	100.0%	0	0.0%	2	100.0%
	37	3	100.0%	0	0.0%	3	100.0%
	40	14	100.0%	0	0.0%	14	100.0%
	41	4	100.0%	0	0.0%	4	100.0%

42	6	100.0%	0	0.0%	6	100.0%
45	4	100.0%	0	0.0%	4	100.0%
47	10	100.0%	0	0.0%	10	100.0%
48	1	100.0%	0	0.0%	1	100.0%
49	2	100.0%	0	0.0%	2	100.0%
50	7	100.0%	0	0.0%	7	100.0%
51	1	100.0%	0	0.0%	1	100.0%
52	4	100.0%	0	0.0%	4	100.0%
58	1	100.0%	0	0.0%	1	100.0%

Descriptives [a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r]

	Age		Statistic	Std. Error	Bootstrap[s]			
					Bias	Std. Error	95% Confidence Interval	
							Lower	Upper
Tech_Ins_Intre_11	27	Mean	1.25	.250	.09[t]	.15[t]	1.14[t]	1.67[t]
		95% Confidence Interval for Mean Lower Bound	.45					
		95% Confidence Interval for Mean Upper Bound	2.05					
		5% Trimmed Mean	1.22		.07[ac]	.16[ac]	1.10[ac]	1.69[ac]
		Median	1.00		.17[t]	.31[t]	1.00[t]	2.00[t]
		Variance	.250		.027[t]	.086[t]	.143[t]	.500[t]
		Std. Deviation	.500		.020[t]	.080[t]	.378[t]	.707[t]
		Minimum	1					
		Maximum	2					
		Range	1					
		Interquartile Range	1		0[ac]	0[ac]	0[ac]	1[ac]
		Skewness	2.000	1.014	-.722[ak]	1.144[ak]	-1.732[ak]	2.646[ak]

	Kurtosis		4.000	2.619	-2.806[ac]	4.324[ac]	-6.000[ac]	7.000[ac]
	Mean		1.50	.289	.00[u]	.17[u]	1.18[u]	1.80[u]
	95% Confidence Interval for Mean	Lower Bound	.58					
		Upper Bound	2.42					
	5% Trimmed Mean		1.50		.00[ad]	.20[ad]	1.13[ad]	1.83[ad]
	Median		1.50		.01[u]	.43[u]	1.00[u]	2.00[u]
	Variance		.333		-.027[u]	.080[u]	.167[u]	.500[u]
30	Std. Deviation		.577		-.029[u]	.070[u]	.408[u]	.707[u]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		1		0[ad]	0[ad]	0[ad]	1[ad]
	Skewness		.000	1.014	-.019[al]	1.435[al]	-2.236[al]	2.449[al]
	Kurtosis		-6.000	2.619	5.222[ad]	4.066[ad]	-6.000[ad]	6.000[ad]
	Mean		1.50	.289	.00[v]	.17[v]	1.20[v]	1.80[v]
	95% Confidence Interval for Mean	Lower Bound	.58					
		Upper Bound	2.42					
	5% Trimmed Mean		1.50		.00[ae]	.21[ae]	1.14[ae]	1.87[ae]
35	Median		1.50		.01[v]	.43[v]	1.00[v]	2.00[v]
	Variance		.333		-.027[v]	.080[v]	.167[v]	.500[v]
	Std. Deviation		.577		-.029[v]	.070[v]	.408[v]	.707[v]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		1		0[ae]	0[ae]	0[ae]	1[ae]

	Skewness		.000	1.014	-.045[am]	1.442[am]	-2.236[am]	2.236[am]
	Kurtosis		-6.000	2.619	5.281[ae]	4.030[ae]	-6.000[ae]	6.000[ae]
	Mean		1.50	.500	.01[w]	.14[w]	1.25[w]	1.80[w]
	95% Confidence Interval for Mean	Lower Bound	-4.85					
		Upper Bound	7.85					
	5% Trimmed Mean		.		1.80E+308[af]	.21[af]	1.17[af]	1.86[af]
	Median		1.50		.01[w]	.37[w]	1.00[w]	2.00[w]
36	Variance		.500		-.125[w]	.098[w]	.200[w]	.500[w]
	Std. Deviation		.707		-.100[w]	.081[w]	.447[w]	.707[w]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		.		2E+308[af]	0[af]	0[af]	1[af]
	Skewness		.	.	1.798E+308[an]	1.602[an]	-2.236[an]	2.000[an]
	Kurtosis		.	.	1.798E+308[af]	4.582[af]	-6.000[af]	5.807[af]
	Mean		1.36	.133	.00[x]	.12[x]	1.11[x]	1.61[x]
	95% Confidence Interval for Mean	Lower Bound	1.07					
		Upper Bound	1.64					
40	5% Trimmed Mean		1.34		-.01[x]	.14[x]	1.07[x]	1.62[x]
	Median		1.00		.11[x]	.29[x]	1.00[x]	2.00[x]
	Variance		.247		-.016[x]	.043[x]	.111[x]	.278[x]
	Std. Deviation		.497		-.019[x]	.050[x]	.333[x]	.527[x]
	Minimum		1					
	Maximum		2					
	Range		1					

	Interquartile Range		1		0[x]	0[x]	0[x]	1[x]
	Skewness		.670	.597	.139[x]	.790[x]	-.499[x]	3.000[x]
	Kurtosis		-1.838	1.154	.974[x]	2.599[x]	-2.571[x]	9.000[x]
	Mean		1.50	.289	-.01[y]	.17[y]	1.20[y]	1.80[y]
	95% Confidence Interval for Mean	Lower Bound	.58					
		Upper Bound	2.42					
	5% Trimmed Mean		1.50		-.01[ag]	.20[ag]	1.17[ag]	1.87[ag]
	Median		1.50		-.02[y]	.44[y]	1.00[y]	2.00[y]
	Variance		.333		-.029[y]	.077[y]	.167[y]	.500[y]
41	Std. Deviation		.577		-.029[y]	.068[y]	.408[y]	.707[y]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		1		0[ag]	0[ag]	0[ag]	1[ag]
	Skewness		.000	1.014	.086[ao]	1.420[ao]	-2.236[ao]	2.236[ao]
	Kurtosis		-6.000	2.619	5.155[ag]	3.952[ag]	-6.000[ag]	6.000[ag]
	Mean		1.50	.224	.00[z]	.17[z]	1.20[z]	1.83[z]
	95% Confidence Interval for Mean	Lower Bound	.93					
		Upper Bound	2.07					
	5% Trimmed Mean		1.50		.00[ah]	.19[ah]	1.13[ah]	1.87[ah]
42	Median		1.50		-.02[z]	.45[z]	1.00[z]	2.00[z]
	Variance		.300		-.027[z]	.055[z]	.167[z]	.333[z]
	Std. Deviation		.548		-.028[z]	.053[z]	.408[z]	.577[z]
	Minimum		1					
	Maximum		2					
	Range		1					

	Interquartile Range		1		0[ah]	0[ah]	0[ah]	1[ah]
	Skewness		.000	.845	.013[ap]	1.240[ap]	-2.449[ap]	2.236[ap]
	Kurtosis		-3.333	1.741	2.248[ah]	3.369[ah]	-6.000[ah]	6.098[ah]
47	Mean		1.20	.133	.02[aa]	.10[aa]	1.08[aa]	1.45[aa]
	95% Confidence Interval for Mean	Lower Bound	.90					
		Upper Bound	1.50					
	5% Trimmed Mean		1.17		.03[ai]	.12[ai]	1.03[ai]	1.45[ai]
	Median		1.00		.01[aa]	.09[aa]	1.00[aa]	1.00[aa]
	Variance		.178		.005[aa]	.060[aa]	.077[aa]	.286[aa]
	Std. Deviation		.422		-.001[aa]	.072[aa]	.277[aa]	.535[aa]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		0		0[ai]	0[ai]	0[ai]	1[ai]
	Skewness		1.779	.687	.043[aa]	.946[aa]	.213[aa]	3.606[aa]
	Kurtosis		1.406	1.334	1.343[ai]	4.733[ai]	-2.800[ai]	13.000[ai]
52	Mean		2.25	.250	.03[ab]	.11[ab]	2.14[ab]	2.50[ab]
	95% Confidence Interval for Mean	Lower Bound	1.45					
		Upper Bound	3.05					
	5% Trimmed Mean		2.22		-.05[aj]	.04[aj]	2.08[aj]	2.22[aj]
	Median		2.00		.07[ab]	.17[ab]	2.00[ab]	2.50[ab]
	Variance		.250		.029[ab]	.109[ab]	.143[ab]	.500[ab]
	Std. Deviation		.500		.019[ab]	.100[ab]	.378[ab]	.707[ab]
	Minimum		2					
	Maximum		3					
	Range		1					

Interquartile Range	1			0^{aj}	0^{aj}	0^{aj}	1^{aj}
Skewness	2.000	1.014		$.092^{aq}$	$.308^{aq}$	1.732^{aq}	2.828^{aq}
Kurtosis	4.000	2.619		1.074^{aj}	1.140^{aj}	4.000^{aj}	8.000^{aj}

Years of Teaching

Case Processing Summary

	Years of Teaching	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Tech Ins Intre 11	2	2	100.0%	0	0.0%	2	100.0%
	3	4	100.0%	0	0.0%	4	100.0%
	4	5	100.0%	0	0.0%	5	100.0%
	5	2	100.0%	0	0.0%	2	100.0%
	6	5	100.0%	0	0.0%	5	100.0%
	7	3	100.0%	0	0.0%	3	100.0%
	9	3	100.0%	0	0.0%	3	100.0%
	10	25	100.0%	0	0.0%	25	100.0%
	11	4	100.0%	0	0.0%	4	100.0%
	12	14	100.0%	0	0.0%	14	100.0%
	15	4	100.0%	0	0.0%	4	100.0%
	20	4	100.0%	0	0.0%	4	100.0%
	24	1	100.0%	0	0.0%	1	100.0%

Descriptives [a, b, c, d, e, f, g, h, i, j, k, l]

	YearsofTeaching	Statistic		Bootstrap[m]

				Std. Error	Bias	Std. Error	95% Confidence Interval	
							Lower	Upper
Tech_Ins_Intre_11	3	Mean	1.75	.250	-.10[n]	.15[n]	1.28[n]	1.86[n]
		95% Confidence Interval for Mean Lower Bound	.95					
		95% Confidence Interval for Mean Upper Bound	2.55					
		5% Trimmed Mean	1.78		-.08[u]	.17[u]	1.22[u]	1.91[u]
		Median	2.00		-.19[n]	.32[n]	1.00[n]	2.00[n]
		Variance	.250		.033[n]	.092[n]	.143[n]	.500[n]
		Std. Deviation	.500		.026[n]	.084[n]	.378[n]	.707[n]
		Minimum	1					
		Maximum	2					
		Range	1					
		Interquartile Range	1		0[u]	0[u]	0[u]	1[u]
		Skewness	-2.000	1.014	.749[aa]	1.192[aa]	-2.646[aa]	2.000[aa]
		Kurtosis	4.000	2.619	-2.737[u]	4.365[u]	-6.000[u]	7.769[u]
	5	Mean	1.50	.500	-.01[o]	.15[o]	1.22[o]	1.75[o]
		95% Confidence Interval for Mean Lower Bound	-4.85					
		95% Confidence Interval for Mean Upper Bound	7.85					
		5% Trimmed Mean	.		1.80E+308[v]	.21[v]	1.16[v]	1.83[v]
		Median	1.50		-.02[o]	.38[o]	1.00[o]	2.00[o]
		Variance	.500		-.136[o]	.097[o]	.200[o]	.500[o]
		Std. Deviation	.707		-.109[o]	.080[o]	.447[o]	.707[o]
		Minimum	1					
		Maximum	2					
		Range	1					
		Interquartile Range	.		2E+308[v]	0[v]	0[v]	1[v]

	Skewness		.	.	1.798E+308[ab]	1.573[ab]	-2.175[ab]	2.236[ab]
	Kurtosis		.	.	1.798E+308[v]	4.616[v]	-6.000[v]	6.000[v]
6	Mean		1.40	.245	.03[p]	.17[p]	1.14[p]	1.76[p]
	95% Confidence Interval for Mean	Lower Bound	.72					
		Upper Bound	2.08					
	5% Trimmed Mean		1.39		.02[w]	.19[w]	1.10[w]	1.83[w]
	Median		1.00		.33[p]	.41[p]	1.00[p]	2.00[p]
	Variance		.300		-.019[p]	.071[p]	.143[p]	.500[p]
	Std. Deviation		.548		-.022[p]	.066[p]	.378[p]	.707[p]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		1		0[w]	0[w]	0[w]	1[w]
	Skewness		.609	.913	-.074[ac]	1.283[ac]	-2.236[ac]	2.646[ac]
	Kurtosis		-3.333	2.000	2.662[w]	3.905[w]	-6.000[w]	7.000[w]
7	Mean		1.33	.333	.09[q]	.15[q]	1.17[q]	1.75[q]
	95% Confidence Interval for Mean	Lower Bound	-.10					
		Upper Bound	2.77					
	5% Trimmed Mean		.		1.80E+308[x]	.18[x]	1.13[x]	1.78[x]
	Median		1.00		.32[q]	.37[q]	1.00[q]	2.00[q]
	Variance		.333		-.005[q]	.096[q]	.167[q]	.500[q]
	Std. Deviation		.577		-.011[q]	.083[q]	.408[q]	.707[q]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		.		2E+308[x]	0[x]	0[x]	1[x]

	9	Skewness		1.732	1.225	-.980[ad]	1.409[ad]	-2.000[ad]	2.449[ad]
		Kurtosis		.	.	1.798E+308[x]	4.445[x]	-6.000[x]	6.000[x]
		Mean		1.33	.333	.09[r]	.16[r]	1.17[r]	1.75[r]
		95% Confidence Interval for Mean	Lower Bound	-.10					
			Upper Bound	2.77					
		5% Trimmed Mean		.		1.80E+308[y]	.20[y]	1.10[y]	1.83[y]
		Median		1.00		.32[r]	.38[r]	1.00[r]	2.00[r]
		Variance		.333		-.008[r]	.096[r]	.167[r]	.500[r]
		Std. Deviation		.577		-.013[r]	.083[r]	.408[r]	.707[r]
		Minimum		1					
		Maximum		2					
		Range		1					
		Interquartile Range		.		2E+308[y]	0[y]	0[y]	1[y]
		Skewness		1.732	1.225	-.989[ae]	1.466[ae]	-2.000[ae]	2.449[ae]
		Kurtosis		.	.	1.798E+308[y]	4.407[y]	-6.000[y]	7.000[y]
	10	Mean		1.40	.100	.00	.08	1.24	1.56
		95% Confidence Interval for Mean	Lower Bound	1.19					
			Upper Bound	1.61					
		5% Trimmed Mean		1.39		.00	.09	1.21	1.57
		Median		1.00		.11	.29	1.00	2.00
		Variance		.250		-.006	.019	.191	.263
		Std. Deviation		.500		-.007	.021	.437	.513
		Minimum		1					
		Maximum		2					
		Range		1					
		Interquartile Range		1		0	0	1	1

	Skewness		.435	.464	.022	.389	-.257	1.296
	Kurtosis		-1.976	.902	.179	.567	-2.235	-.356
11	Mean		1.50	.289	.00[s]	.17[s]	1.20[s]	1.80[s]
	95% Confidence Interval for Mean	Lower Bound	.58					
		Upper Bound	2.42					
	5% Trimmed Mean		1.50		.00[z]	.20[z]	1.17[z]	1.83[z]
	Median		1.50		.00[s]	.43[s]	1.00[s]	2.00[s]
	Variance		.333		-.025[s]	.081[s]	.200[s]	.500[s]
	Std. Deviation		.577		-.026[s]	.070[s]	.447[s]	.707[s]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		1		0[z]	0[z]	0[z]	1[z]
	Skewness		.000	1.014	-.011[af]	1.403[af]	-2.236[af]	2.236[af]
	Kurtosis		-6.000	2.619	5.175[z]	3.919[z]	-6.000[z]	6.000[z]
12	Mean		1.36	.133	.01[t]	.12[t]	1.12[t]	1.60[t]
	95% Confidence Interval for Mean	Lower Bound	1.07					
		Upper Bound	1.64					
	5% Trimmed Mean		1.34		.01[t]	.13[t]	1.07[t]	1.61[t]
	Median		1.00		.12[t]	.30[t]	1.00[t]	2.00[t]
	Variance		.247		-.012[t]	.040[t]	.111[t]	.278[t]
	Std. Deviation		.497		-.015[t]	.046[t]	.333[t]	.527[t]
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		1		0[t]	0[t]	0[t]	1[t]
	Skewness		.670	.597	.071[t]	.748[t]	-.455[t]	2.850[t]

	Kurtosis	-1.838	1.154	.778[t]	2.395[t]	-2.571[t]	8.123[t]

Grade Level

Case Processing Summary

	GradeLevel	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Tech_Ins_Intre_11	6th	11	100.0%	0	0.0%	11	100.0%
	7th	21	100.0%	0	0.0%	21	100.0%
	8th	44	100.0%	0	0.0%	44	100.0%

Descriptives[a]

	GradeLevel			Statistic	Std. Error	Bootstrap[b]			
						Bias	Std. Error	95% Confidence Interval	
								Lower	Upper
Tech_Ins_Intre_11	6th	Mean		1.27	.141	.01[c]	.13[c]	1.09[c]	1.57[c]
		95% Confidence Interval for Mean	Lower Bound	.96					
			Upper Bound	1.59					
		5% Trimmed Mean		1.25		.01[d]	.14[d]	1.05[d]	1.58[d]
		Median		1.00		.06[c]	.22[c]	1.00[c]	2.00[c]
		Variance		.218		-.010[c]	.055[c]	.091[c]	.286[c]
		Std. Deviation		.467		-.016[c]	.064[c]	.302[c]	.535[c]
		Minimum		1					
		Maximum		2					
		Range		1					
		Interquartile Range		1		0[d]	0[d]	0[d]	1[d]

	Skewness		1.189	.661	.126[c]	.945[c]	-.374[c]	3.317[c]
	Kurtosis		-.764	1.279	1.503[d]	3.820[d]	-2.800[d]	11.000[d]
7th	Mean		1.67	.126	.00	.09	1.48	1.86
	95% Confidence Interval for Mean	Lower Bound	1.40					
		Upper Bound	1.93					
	5% Trimmed Mean		1.63		.01	.10	1.43	1.85
	Median		2.00		-.09	.26	1.00	2.00
	Variance		.333		-.007	.037	.241	.390
	Std. Deviation		.577		-.007	.033	.491	.624
	Minimum		1					
	Maximum		3					
	Range		2					
	Interquartile Range		1		0	0	0	1
	Skewness		.128	.501	.013	.322	-.413	.839
	Kurtosis		-.537	.972	.287	.615	-.748	1.652
8th	Mean		1.45	.076	.00	.05	1.36	1.55
	95% Confidence Interval for Mean	Lower Bound	1.30					
		Upper Bound	1.61					
	5% Trimmed Mean		1.45		.00	.05	1.34	1.55
	Median		1.00		.18	.36	1.00	2.00
	Variance		.254		-.002	.006	.234	.256
	Std. Deviation		.504		-.003	.006	.484	.506
	Minimum		1					
	Maximum		2					
	Range		1					
	Interquartile Range		1		0	0	1	1
	Skewness		.189	.357	.006	.209	-.189	.625
	Kurtosis		-2.060	.702	.048	.115	-2.108	-1.687

a. Tech_Ins_Intre_11 is constant when GradeLevel = 6th in one or more split files. It has been omitted.

b. Unless otherwise noted, bootstrap results are based on 1000 stratified bootstrap samples

c. Based on 954 samples

d. Based on 953 samples