# A SURVEY OF ATTITUDES AND OPINIONS REGARDING TECHNOLOGY INTEGRATION AND BEST PRACTICES IN THE ELEMENTARY CLASSROOM

By

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# ABSTRACT

The purpose of this study was to find out the attitudes and opinions of teachers in an elementary setting regarding technology integration and best practices in the elementary classroom and to see if teaching experience has an impact on these attitudes and opinions. The research findings include the reactions to questions regarding teaching experience and grade level, general technology proficiency, specific technology use in the classroom, opinions and attitudes toward technology, and areas of improvement and technical needs. The research was conducted using an anonymous survey created with Google Docs. The survey was administered to 28 teachers with 16 (57%) teachers participating in the survey. Statistical calculations include descriptive data, Chi Square, and ANOVA calculations. The results of the survey indicate that there is a difference in opinions among teachers regarding technology usage and best practices. Further study may be justified to obtain more specific information regarding what types of training and technology programs teachers would like to see implemented. Additional study may also be necessary to determine the needs for teachers regarding technology usage and best practices district wide.

# INTRODUCTION TO THE STUDY

## *Background Issues and Concerns*

A suburban school district located in the Midwest which will be referred to as KSD, has experienced budget cuts in the past two years. The district has a total student population of 3,400 students and has seen a growth rate averaging 5% per year over the recent years. The district employs over 200 classroom teachers with a ratio of 22 to 1. The average teacher salary is $45,311 and average years of experience are 12.5. Over 58% of the teachers have a Master's degree or higher. Programs that were reduced by the budget cut included library media, elementary keyboarding, and technology. The district has limited resources and would like to see continual improvement in instructional technology while maintaining appropriate fund balances. The district would also like to see a district-wide emphasis on STEM (science, technology, engineering and mathematics). The district recently asked the community to vote for a 56-cent levy increase which passed. The dollars generated from the levy will be used to improve many school programs dedicated to the improvement of student achievement, among those being to improve lagging computer and technology programs. With the increased funds, the district also recently hired an instructional technology coach in hopes that teachers will begin to feel more comfortable with new technology programs and begin to implement more technology methods into their daily routine and lessons. Elementary keyboarding instruction was also returned to the district. This project will include a survey of teacher attitudes and opinions regarding technology integration and best practices in the elementary classroom. The analysis of results will discern the attitudes and opinions of the teachers and how they feel regarding their personal knowledge of technology, usage in the classroom, and best practices in teaching using technology in the elementary classroom.

*Practice Under Investigation*

The practice under investigation is to discover how elementary teachers feel about their personal use of technology, integration of technology into the classroom, and how they feel technology is best used for in regard to student learning.

*School Policy to Be Informed by the Study*

The elementary teachers surveyed in this study range from grades K-5 and special content areas. K-5 self-contained classroom teachers are equipped with technology in their rooms and are expected to integrate technology into their lessons on a regular basis. Special content area teachers may vary with use of technology due to the nature of their position or due to the fact that they rely on using the equipment made available to the classroom teacher. However, in light of the fact that special content area teachers do use technology on occasion for instruction they were chosen to be informed and included in the study.

*Conceptual Underpinnings for the Study*

With education being in the center of progression and change in technology, many districts have been encouraging teachers to become trained in instructional technology teaching methods. Many teachers have shied away from incorporating technology into their lessons feeling as though technology is just a conglomeration of devices rather than another way at looking at instruction. However, many teachers have also embraced technology methods and believe that the technology enhancements have allowed for more individualized instruction and provide another presentation of material to students that helps meet the needs of diverse learners. Technology adds another dimension to teaching. Students with special needs now have visual and audio media to reinforce traditional instruction. The research from this study will show how

student exposure to these technology enhancements used in the classroom and for intervention will help them to achieve versus being exposed solely to traditional methods. The survey used for the study will reflect the attitudes and opinions teachers have about using technology to enhance instruction.

*Statement of the Problem*

There is a want for information that validates that the use of technology methods will enhance traditional teaching methods in the classroom in order to increase student achievement.

*Purpose of the study*

The purpose of the study is to establish whether or not the current technology methods being used in elementary classrooms are instrumental in the enhancement of traditional teaching methods to meet the needs of diverse learners and classroom teachers of various levels of teaching experience. The information gained will help administrators know how to approach teacher faculty with the intent of cultivating the use of technology methods to be implemented as best practice in the classroom.

*Research questions*

*RQ 1:* What is the overall opinion of elementary classroom and special content area teachers with different levels of teaching experience at SE regarding technology usage and best practice?

*RQ 2:* Is there a difference of opinion among elementary classroom and special content area teachers based on the number of years of teaching experience regarding the use of technology and best practices in the elementary classroom?

*Null hypotheses*

$H_O$ There is no difference of opinion among elementary classroom and special content area teachers based on the number of years of teaching experience regarding the use of technology and best practices in the elementary classroom.

*Anticipated benefits of the study*

The results of this study will inform school administration about the effectiveness of the technology currently being used to enhance traditional teaching methods in the elementary classroom and whether or not it is meeting the needs of all students and teachers. It will help school administrators know what types of technologies are beneficial for increasing student achievement at the elementary level and where money and efforts concerning technology purchase and training can best be employed.

*Definition of Terms*

AIMSWEB: Progress monitoring software program

DESE: Missouri Department of Secondary and Elementary Education

IDEA: Individuals with Disabilities Education Act

MST: Math, Science, and Technology

NCLB: No Child Left Behind

RTI: Response to Intervention

STEM: Science, Technology, Engineering, and Mathematics coalition

*Summary*

KSD is a Midwestern suburban school district with one high school, one middle school, one junior high and four elementary schools. Students with disabilities are included in the regular education classroom as directed by IDEA and NCLB. In addition all students receive intensive instruction and intervention for 30 minutes a day in reading and language development. Various methods of teaching instruction are used in each classroom. Many new technology programs and hardware have been made available to the district that are designed to help increase student achievement in these areas. A survey was conducted among elected staff at an elementary building in the district referred to as SE. A research study was being done to note whether these instructional technology methods are operative in enhancing traditional teaching methods. It also examined whether teachers feel that their knowledge of technology is adequate and if they are using technology effectively in the classroom.

## Review of Literature

With technology methods becoming more and more prominent in the classroom, many teachers wonder how technological methods weigh out among traditional methods when it comes to best practices in teaching in the elementary setting. Additionally, more teachers are becoming exemplary in using technology in place of traditional teaching. Educators today are often faced with many alternative and opposing views of technology and what its purpose is in the educational setting. While most teachers recognize the importance of technology use, they generally lack a clear image of how technology can and should be used to support best practices. Given the progressing nature of technology and best practices, the tools and how teachers should use the technology are also changing quickly. It is quite possible that that there are very different beliefs about technology usage in the classroom. A study was conducted by Peggy A. Ertmer, Sangeetha Gopalakrishnan, and Eva M. Ross to examine the instructional beliefs and classroom practices of technology using teachers to determine the extent that their beliefs correspond with educational best practices. It was concluded that while technology integration is quickly becoming an expectation for all teachers there is little clarity on how it translates into practice. Based on the results of the study, best practice with technology usage may be an unrealistic goal for teachers due to the ever evolving forms of technology and its professional development requirements (Ertmer, Gopalakrishnan, & Ross, 2001).

One of the most important things to remember is that there are links among technology, education, and curricular content and researchers have examined many ways to improve technology integration practices in the classroom and professional development efforts (An & Reigeluth 2011). According to John E. Shinsky and Hans A. Stevens (2011), in order to prepare 21st century educators, educational leadership professors should be learning and teaching the utilization of ever more sophisticated technologies. School leaders must focus on equipping students and staff with implementing various types of technologies to improve student

achievement and enhance the skills of staff and students. The article Teaching Using Web 2.0 applications by Shinsky (2011) discusses the use of various technology tools such as Wikis, discussion boards, Google apps, and other resources to facilitate collaborative planning and learning. Shinsky and Stevens (2011) suggest that technology should be used in a routine manner to support learning goals (Shinsky & Stevens 2011).

According to Lee J. Lesisko, Robert J. Wright, and Brenda O'Hern (2010), technology leadership in schools can take many forms. Technology leaders in the school assist educators and students directly on the use and incorporation of technology. Highly qualified teachers are technicians that must be open to change and understand instructional technology and curriculum development (Lesisko, Wright, & O'Hern 2010). Lesisko (2010) also suggests that technology integration into the classroom can be difficult without the proper implementation. Moreover, just as school libraries have been transformed to support curriculum, instructional technology can now support the curriculum as well with its resourcefulness (Lesisko, Wright, & O'Hern 2010). In contrast, even though teachers are experiencing professional development for using technology as a best practice in the classroom, there is still resistance when teachers are expected to give up more of their time (Faulder, 2011).

The MST movement in the early 90's had a large impact on technology integration in education and paved the way for the recent STEM initiatives (Kelley, 2010). Many of the issues with consistent use of technology in the classroom are often linked to funding. Kelley (2010 explores the true definition of the STEM initiative and reviews the history of efforts in technology education. The MST movement began as a result of trouble within schools throughout the U.S. and the need to improve American student's scores specifically in math and science (Kelley, 2010). Many studies regarding disciplines and funding connected to technology

were limited due to poor perceptions and misconceptions regarding technology education (Kelley, 2010). Lesisko (2010) states that the nation needs those that are educated and experienced in the use of technology and its development. In spite of roadblocks and lack of funding, there is still a great need for further research in the field of technology education (Kelley, 2010).

Aside from the many instructional uses of technology, technology enabled assessments for diagnosing and modifying conditions of learning are also being examined. Many assessments in the future will require the use of technology to complete simulations and measure student performance. In fact, many assessments will be entirely computer administered and will include interactive, simulation based tasks that involve problem solving, communication, or collaboration. Technology enabled assessments for classroom instruction includes grading and accountability uses or summative assessments, as well as assessments for learning to diagnose and modify instruction or formative assessments. Teachers can examine data and make adjustments to instruction according to that data. Standardized testing done electronically can also provide a feedback system to researchers and teachers from students (Pellegrino & Quellmalz 2010).

Teachers are always searching for useful, effective, and engaging e-tools while taking into account student evaluation and stimulation that keeps students involved in the learning tasks (Otta & Tavella 2010). Enhancing student engagement and motivation is an important goal and educators are exploring technological means to keep kids enthusiastic about learning. A three year study was done in a primary school aimed at helping students develop higher level reasoning abilities with the use of digital games. Design and interface features were looked at to see if they suited the purposes for learning. 40 students were divided into parallel classes based

on grade and age and used the digital games during normal school hours. The games were chosen according to target age. The results were based on enthusiasm towards completing the activity, satisfaction with the performed activity, and the level of engagement during the activity (Otta & Tavella 2010).

A study was done by Maria Earman Stetter and Marie Tejero Hughes (2011) to determine whether computer assisted instruction was effective in helping students with learning disabilities. The majority of students showed improved comprehension scores. This suggests that daily readings on the computer helped increase reading comprehension. The study also implies that the extra, repeated drill that a computer provides makes a difference for the student with LD. The main purpose of the study was to present a new text structure as a strategy with story mapping to help the LD student. Nine students were chosen for the study and were identified as having a learning disability in the area of reading. Each student completed a baseline phase, intervention phase, and a maintenance phase. Each was given daily quizzes and standardized tests to monitor progress. Suggestions of the study are that reading comprehension strategies layered with computer strategies can benefit LD students (Stetter & Hughes, 2011).

Other uses of technology in instructional practices include tutoring and support for students. There are many elementary teachers that use classroom websites to help support literacy in and out of the classroom setting. According to Elizabeth A. Baker (2007), elementary classroom websites are currently very prevalent, and can provide students with vast opportunities to learn and collaborate with teachers and other students. Although many of the sites vary in content and the study assumes the position that internet technologies are commonly available in classrooms and communities, there is still substantial evidence by Baker (2007) that these sites

support children's literacy and other content areas. Baker (2007) draws on two ideas, one being that classroom websites provide internet opportunities to support learning within classrooms, and the other being that classroom websites provide internet opportunities to support learning outside of the classroom. As a best practice, teachers can use the internet resources to reinforce basal skills and allow students to work on becoming more proficient in their skills in the classroom. Outside of the classroom, parents and students can have access to information occurring in the classroom such as homework, spelling and vocabulary words, reading skills, etc. Teachers can easily communicate with parents regarding classroom activities and student accomplishments (Baker, 2007).

Many teachers are also effectively integrating technology with regards to mathematics, problem solving, and RTI for students with or at risk of learning disabilities (Allsop, McHatton, & Farmer 2010). Studies have shown that student learning can be enhanced using specific multimedia in digital environments. One study in particular focused on STEM education and individuals with learning disabilities and showed how students that used an audio textbook had better content acquisition rather than while using a regular textbook. Physical environments are now being developed to meet the needs of diverse learners in all subject areas. Technology can support learning at all tiers of instruction and should be used in an individualized persistent manner to help students overcome barriers and increase participation. These views should encourage educators to expand their understanding of technology in supporting student needs and how technology can be utilized to enhance performance in the classroom (Allsop, McHatton, & Farmer 2010).

A study by Means (2010) looked at technology integration practices and how they were associated with student gains in learning. Interviews and observations with staff at schools where teachers were obtaining above average achievement gains using mathematics and reading software were used to compare to schools that had below average gains. Findings that were highlighted in the study include the importance of software usage, principal support, teacher collaboration, and computer generated student performance data (Means, 2010). The question that arises with technology integration is will educators expend the effort necessary to integrate technology? Teachers often have to be convinced that there is a payoff in terms of student learning. Mean's (2010) study showed evidence that technology implementation will produce student learning gains and should the thought of as a "best practice" in education.

There are however, barriers in elementary technology programs and their ability to incorporate technology into the classroom (Smith & Owens 2010). Data was used to examine differences between teacher training programs in three types of teaching institutions, public, private non-profit, and private for-profit. According to the results of the study private for-profit is the leader in technology integration and use. Private for-profit institutions are using more online programs and emphasize technology usage. Over the past few years national test results have shown little improvement and student achievement gaps still persist. One strategy for improving student learning in these areas is through the integration of educational technology into classrooms. This means that teacher technology preparation must also increase. Technology usage outside of the classroom is growing and will continue to do so. Therefore, barriers with the educational use of technology need to be identified (Smith & Owens 2010).

# Research Methods

## *Research Design*

All statistical information gathered for this study was calculated and tested using ASP. All tests conducted had a set alpha level of 0.25. The independent variable was a group of 20 first grade students. The dependent variables are the current level that the students were at when tested (Tier 1, 2, or 3), the method of instruction used, and student achievement scores. A survey was conducted to determine the teaching methodology of other teachers. Tests for this study include descriptive analysis, chi square, and ANOVA.

## *Study Group Description*

The study group for this research project is a combined group of 16 K-5 and special content area elementary teachers from one elementary building in the district. Each classroom at SE supports students of different levels of student achievement based on pre-test information collected and calculated in AIMSWEB. Tier 1 students being at or above grade level or benchmark requirements, Tier 2 students needing some support and strategic monitoring, and Tier 3 students requiring a great deal of support and intensive progress monitoring. K-5 and special content area teachers often used technology in different ways to support their students' needs in the classroom. This group of teachers was chosen due to the frequency and nature of technology usage in their lessons.

*Data Collection and Instrumentation*

An anonymous questionnaire was distributed to elected K-5 and special content area teachers at SE. The questionnaire specifically asks for information regarding technology and its usage in the elementary classroom by these professionals.

*Statistical Analysis Methods*

Statistical data was gathered and recorded in Microsoft Excel as well as AIMSWEB. Statistical calculations for this study were performed by A Statistical Package (ASP) software. Statistical calculations include descriptive data, Chi square, and ANOVA calculations.

## Findings

In order to govern the attitudes and perceptions of elementary K-5 and special content area teachers a survey was conducted among the group selected. The survey first asked teachers what their level of experience was along with what grade level that they currently teach.

*Table 1*

Question: What is your current level of teaching experience?

VARIABLE: YEARS OF TEACHING EXPERIENCE

| | FRQ. | CUM. | % | CUM. | FREQUENCY PLOT |
|---|---|---|---|---|---|
| x < 1 | 0 | 0 | 0 | 0 | \| |
| 1 <= x < 2 | 1 | 1 | 6.3 | 6.3 | \|*** |
| 2 <= x < 3 | 3 | 4 | 18.8 | 25 | \|********** |
| 3 <= x < 4 | 7 | 11 | 43.8 | 68.8 | \|********** |
| 4 <= x < 5 | 4 | 15 | 25 | 93.8 | \|********** |
| 5 <= x < 6 | 1 | 16 | 6.3 | 100 | \|*** |
| 6 <= x | 0 | 16 | 0 | 100 | \| |

SE has a total faculty of 385 students and 29 teachers. With the author of the survey being exempt from the survey 28 responses were possible. Based on possible frequency of technology usage 28 teachers were offered to participate in the survey regarding attitudes and opinions of technology usage. As shown in Table 1, of the 28 teachers 16 of them chose to respond to the survey. Therefore, of the 28 teachers surveyed 58% responded to the survey. The participants were asked what their current level of teaching experience was. Of the 16 responses, there was 1 (6.3%) teacher with 1-5 years' experience in group 1, 3 (18.8%) teachers with 6-10 years' experience in group 2, 7 (43.8%) teachers with 11-15 years' experience in group 3, 4

(25%) teachers with 16-20 years' experience in group 4, and 1 (6.3%) teacher with 21+ years in the fifth group.

*Table 2*

Question: What grade level do you currently teach?

VARIABLE: GRADE LEVEL

| | FRQ. | CUM. | % | CUM. | FREQUENCY PLOT |
|---|---|---|---|---|---|
| x < 1 | 0 | 0 | 0 | 0 | \| |
| 1 <= x < 2 | 4 | 4 | 25 | 25 | \|********** |
| 2 <= x < 3 | 8 | 12 | 50 | 75 | \|********** |
| 3 <= x < 4 | 4 | 16 | 25 | 100 | \|********** |
| 4 <= x | 0 | 16 | 0 | 100 | \| |
| TOTAL | 16 | 100 | | | |

Table 2 shows the itemization of the current grade level taught by the 16 participating teachers. Of the 16 participating teachers 12 (75%) teachers teach in a K-5 self-contained classroom. Of those 12 teachers, 4 (25%) teach at the primary K-2 level and 8 (50%) teach at the intermediate level. The remaining 4 (25%) teachers teach a special content area to grades K-5.

The next section of the survey asked 8 questions regarding general technology usage and the current level of proficiency regarding competency with general technology use. For each question a scale of 1-5 was given to the participant with 1 being Very Weak and 5 being Very Proficient. The total percentages from the survey were displayed in a chart created with Microsoft Excel and Microsoft Word.

*Table 3*

Question: How proficient are you at learning to use a new piece of software?

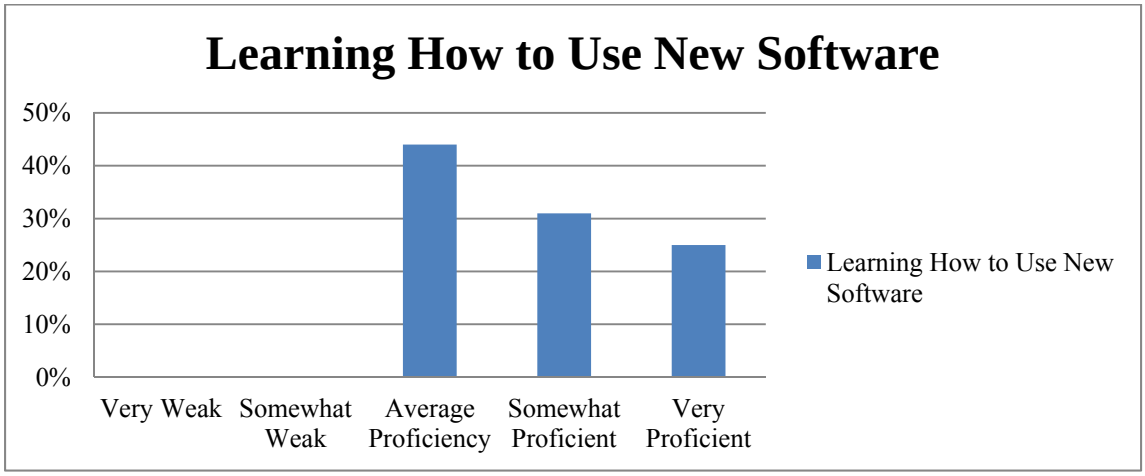
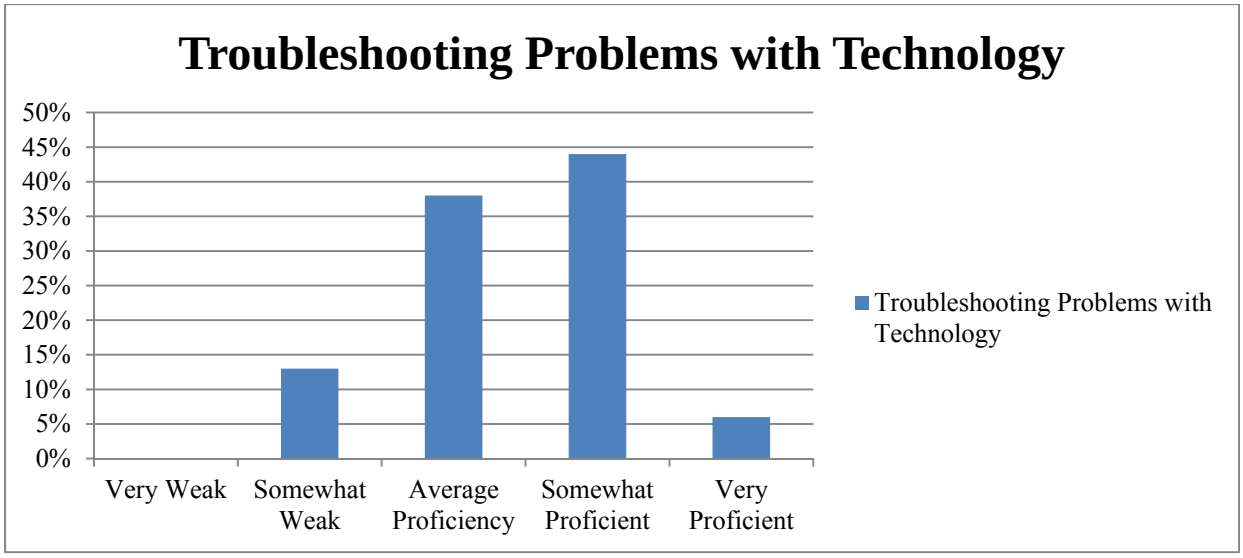



Table 3 shows the level of proficiency by the participating teachers regarding introduction to new software. Of the 16 teachers surveyed 0 (0%) felt very weak or somewhat weak in their skills when asked to learn new software. There were 12 (75 %) teachers that felt that they had average proficiency when it came to learning new software. 3 (19%) teachers felt that they were somewhat proficient in learning new software and 1 (6%) teacher felt as though they were very proficient in learning new software.

*Table 4*

Question: How proficient are you at troubleshooting problems that occur when using technology?




As noted in Table 4, teachers were asked how comfortable they were troubleshooting problems that arose when using technology. The largest number of teachers, 7 (44%) felt that they were somewhat proficient in troubleshooting technology problems. The next largest number was 6 (38%) teachers that felt as though their proficiency with troubleshooting was average. The smallest group of teachers had 1 (6%) teacher feeling as though they are very proficient with troubleshooting. There were 2 teachers felt as though they were somewhat weak with troubleshooting skills and 0 (0%) teachers that felt like their troubleshooting was very weak.

*Table 5*

Question: How proficient are you in using productivity tools (i.e. word processing, excel spreadsheet, power point presentation)?

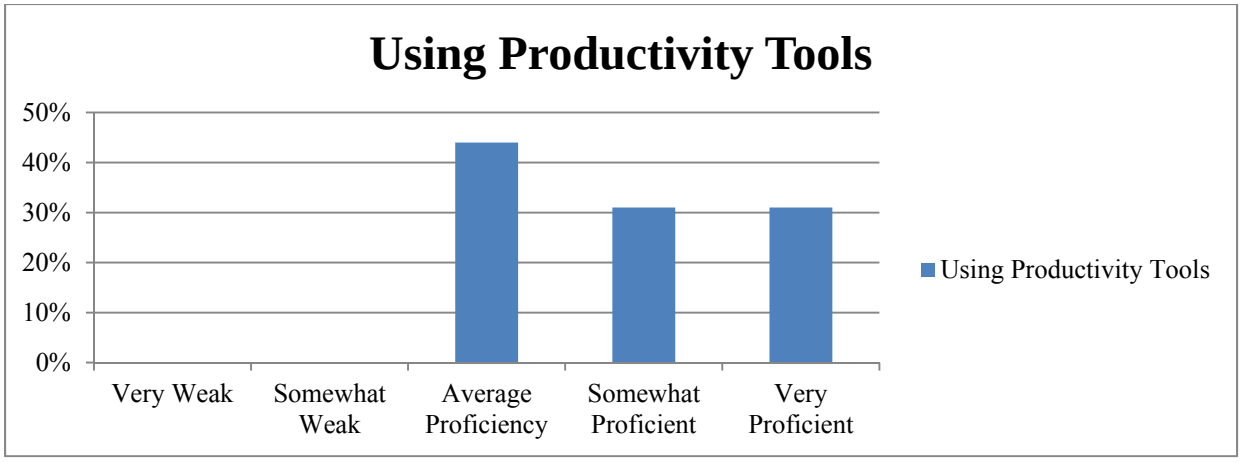



Table 5 indicates that the majority of teachers surveyed (44%) felt that they had average proficiency in using productivity tools. 5 (31%) teachers felt that they were somewhat proficient in using productivity tools and 4 (25%) felt as though they were very proficient in using productivity tools. There were 0 (0%) teachers that felt as though they were very weak or somewhat weak with productivity tool usage.

*Table 6*

Question: How proficient are you in using productivity tools (i.e. word processing, excel spreadsheet, power point presentation)?

| | Summary of Chi Square Analysis | | | | |
|---|---|---|---|---|---|
| Experience | K-5 Classroom Teachers | Special Content Area Teachers | Chi-Sq | Df | p-Value |
| 1-5 Years | 6.25% | 0% | | | |
| 6-10 Years | 12.5% | 6.25% | | | |
| 11-15 Years | 37.5% | 6.25% | | | |
| 16-20 Years | 18.75% | 6.25% | | | |
| 21+ Years | 0% | 6.25% | 14.4 | 1 | 0.07 |

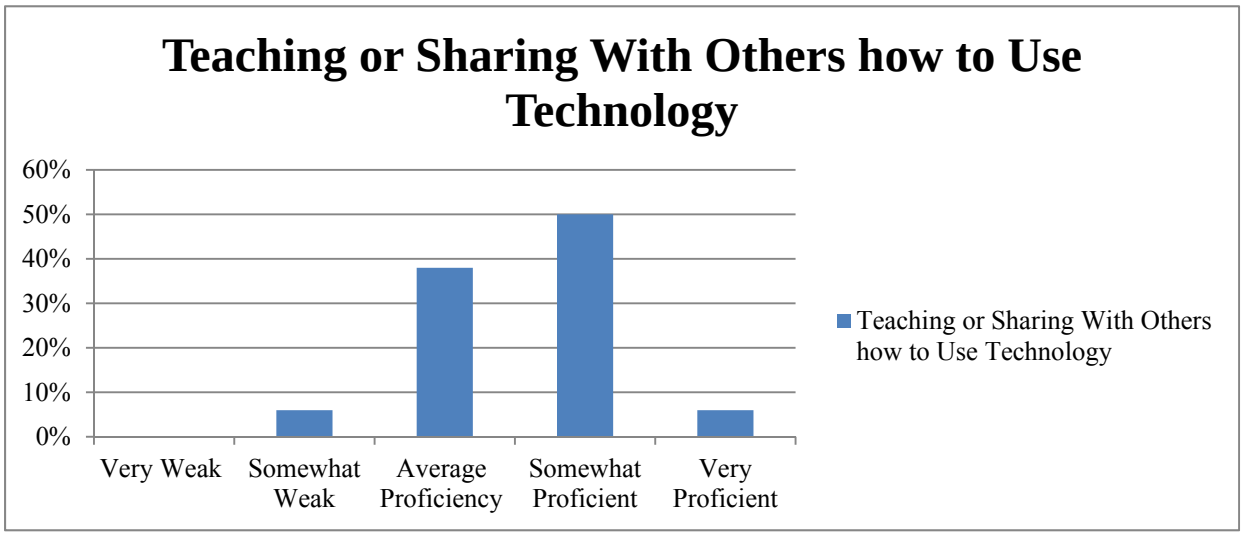
Sig. <= 0.25

A Chi Square analysis was calculated to see if there was a difference in response to certain technology proficiency based on years of teaching experience. The question regarding productivity tools was chosen due to the fact that that is the most common type of technology used on a regular basis by teachers. 12 K-5 Classroom teachers responded with 1 (6.25%) teaching 1-5 years, 2 (12.5%) teaching 6-10 years, 6 (37.5%) teaching 11-15 years, 3 (18.75%) teaching 16-20 years, and 0 (0%) teaching 21+ years. The remaining 4 special content area teachers showed 0 (0%) teachers at 1-5 years teaching experience, and 1 (6.25%) in each category 6-10 years, 11-15 years, 16-20 years, and 21+ years of teaching experience. There is a significant difference (Chi square (8) = 14.4, p-value = 0.07 with sig ≤ 0.25) in opinion between regular classroom teachers and special content area teachers with different levels of experience regarding technology usage and best practice. Therefore, the hypothesis is rejected for this

question. There is a significant difference between regular classroom teachers and special content area teachers with different levels of experience regarding technology usage and best practice.

*Table 7*

Question: How proficient are you in teaching or sharing with others how to use technology?




In Table 7, of the 16 teachers surveyed, 8 (50%) felt as though they were proficient when it came to teaching or sharing with others how to use technology. 6 (38%) teachers felt that they had average proficiency and felt comfortable sharing and teaching others about technology. 1 (6%) teacher felt very proficient about sharing and teaching technology to others while 1(6%) felt very weak about teaching or sharing technology with other teachers.

*Table 8*

Question: How proficient are you in integrating technology into daily lessons and supporting curriculum standards?

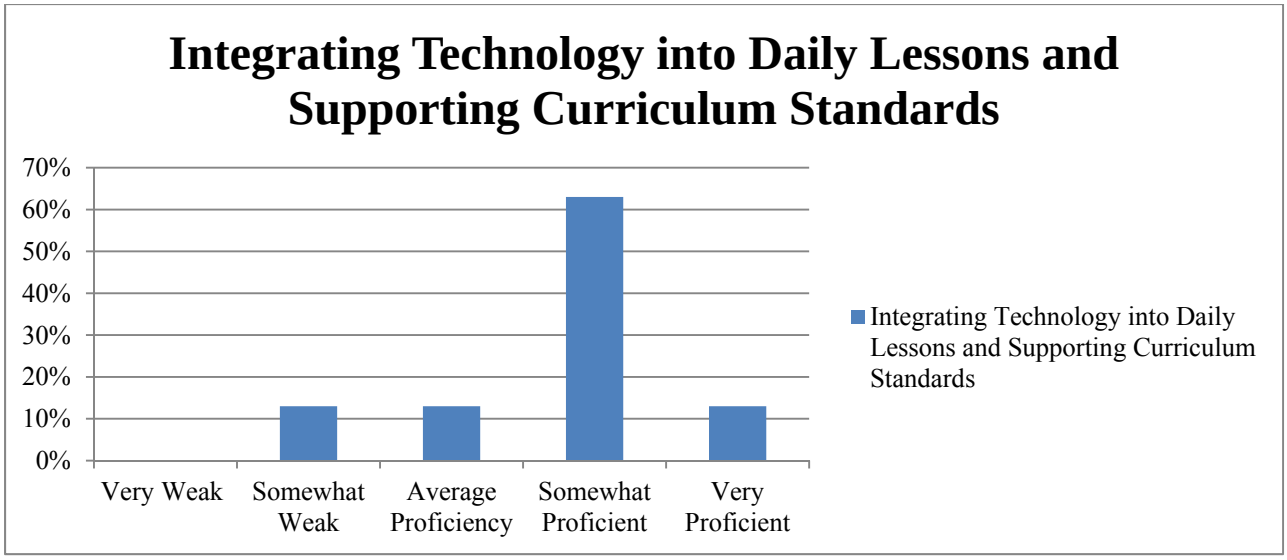
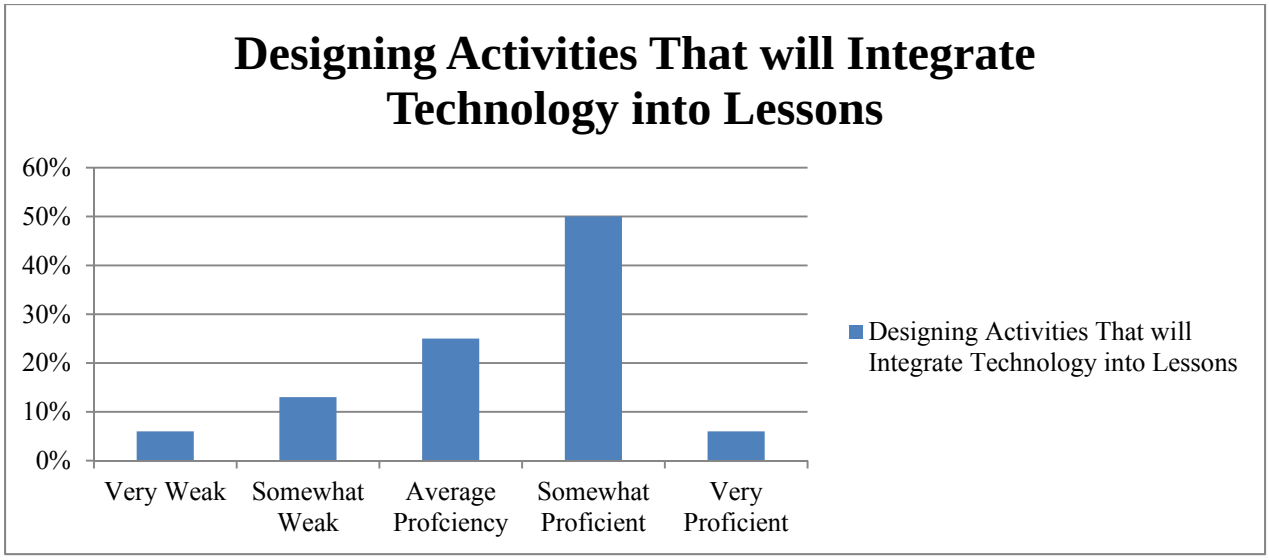



Table 8 reflects how well teachers integrate technology into daily lessons and how well curriculum standards are supported. In the categories of average proficiency, somewhat proficient, and very proficient there were 2 (13%) teachers in each category that integrated technology into daily lessons and supported curriculum standards with technology, for a combined total of 6 teachers. The remaining 10 (63%) teachers felt as though they are somewhat proficient in integrating technology into daily lessons and supporting curriculum standards.

*Table 9*

Question: How proficient are you in designing activities that will integrate technology into lessons?




In Table 9, it is apparent that the majority of teachers surveyed are somewhat proficient in designing lessons that will integrate technology into lessons with 8 (50%) teachers responding to this category. In the categories very weak and very proficient there was 1 (6%) teacher that responded to each category. 2 (13%) teachers felt somewhat weak in designing activities that integrated technology into lessons and 4 (25%) felt that they had average proficiency in designing activities that integrated technology into lessons.

*Table 10*

Question: How proficient are you in utilizing learning opportunities needed to advance technology skills?

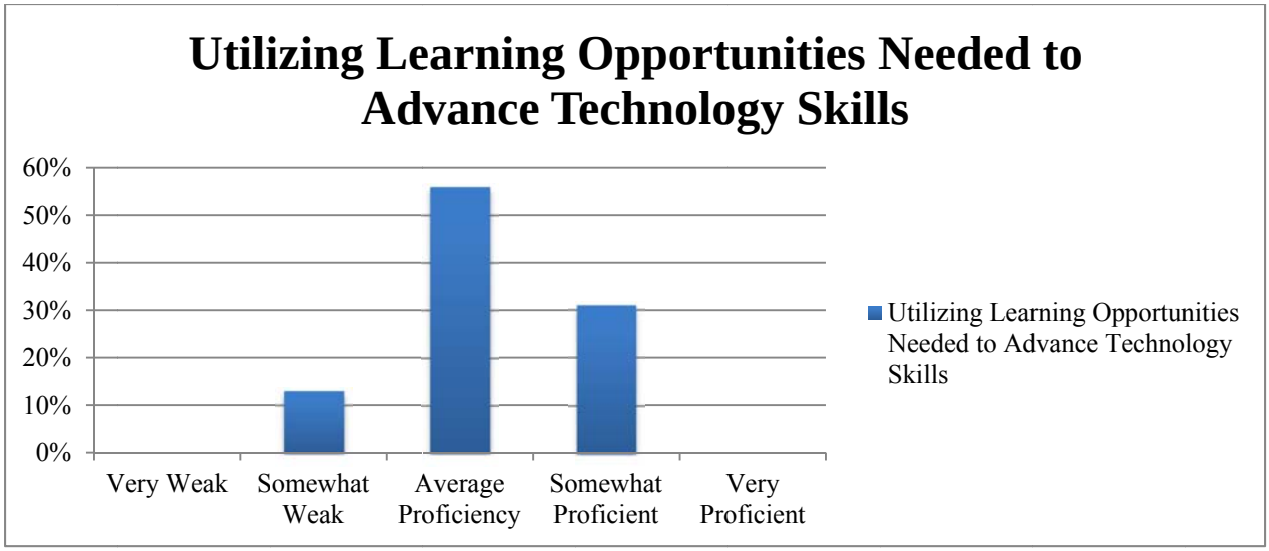



Table 10 shows how well the teachers that were surveyed utilize learning opportunities needed to advance their technology skills in the classroom. The largest number of teachers, 9 (56%), felt that they had average proficiency in this area. 5 (31%) teachers felt that they were somewhat proficient in utilizing learning opportunities needed to advance technology skills. 2 (13%) teachers felt somewhat weak in this area and 0 (0%) teachers felt very weak in this area. There were also 0 (0%) responses to very proficient in utilizing learning opportunities needed to advance technology skills.

The next section of the survey asked teachers about specific technologies that teachers use in the classroom and how often they use them. Teachers were supposed to indicate the amount of time that they spent working with certain technologies, either on a daily, weekly, monthly basis or never. Technologies included were types of software, hardware, and internet usage.

Table 11

Question: How often do you use word processing?

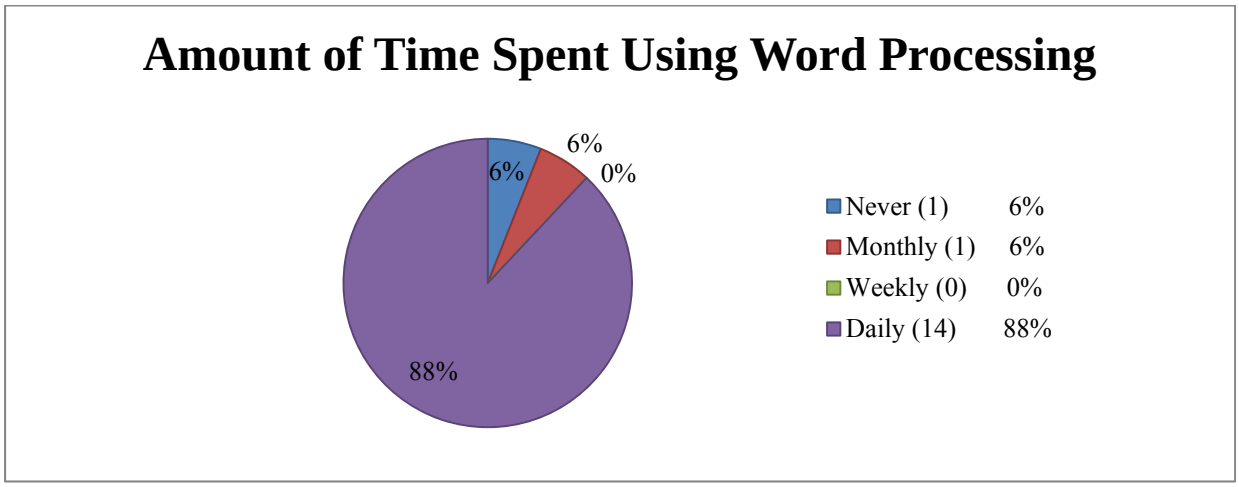
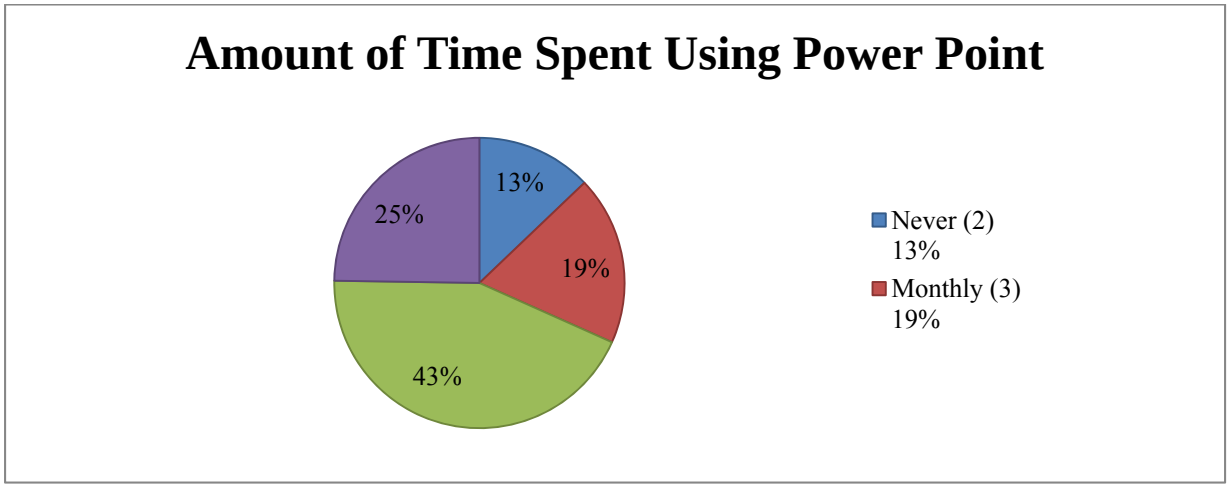



Table 11 reflects that word processing is used most frequently by teachers with 14 (88%) teachers using word processing daily. 2 (6%) teachers used word processing on a monthly basis and 2 (6%) teachers never use it. 0 (0%) responded to using it on a weekly basis.

*Table 12*

Question: How often do you use PowerPoint?




As noted in Table 12, most of the teachers surveyed, 7 (44%), use PowerPoint on a weekly basis. 4 (25%) teachers use PowerPoint on a daily basis, 3 (19%) use it on a monthly basis, and 2 (13%) teachers never use PowerPoint.

*Table 13*

Question: How much time do you spend using Excel Spreadsheet?

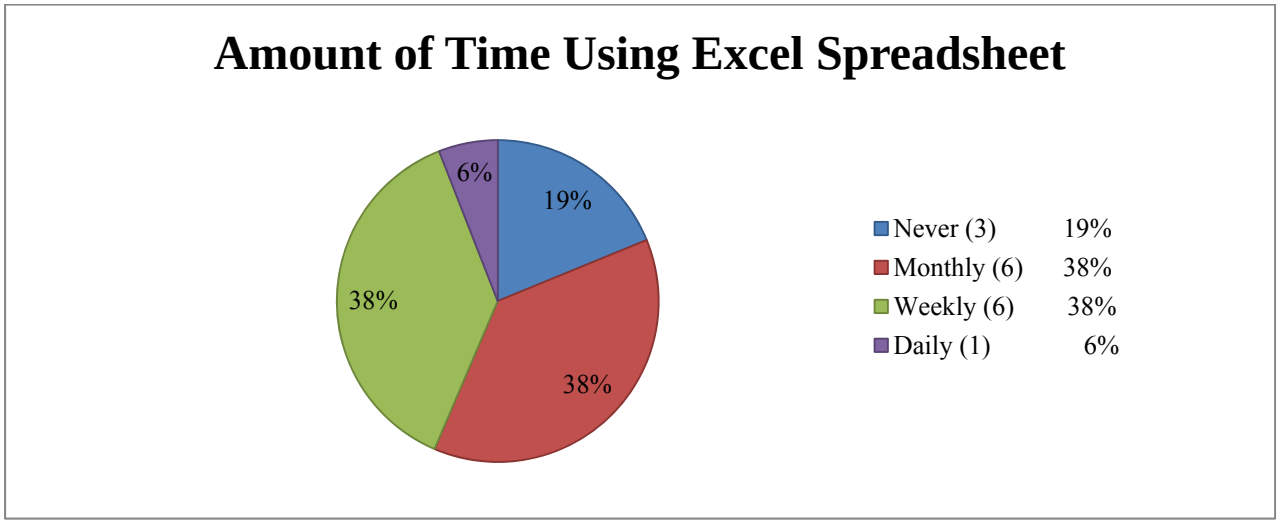
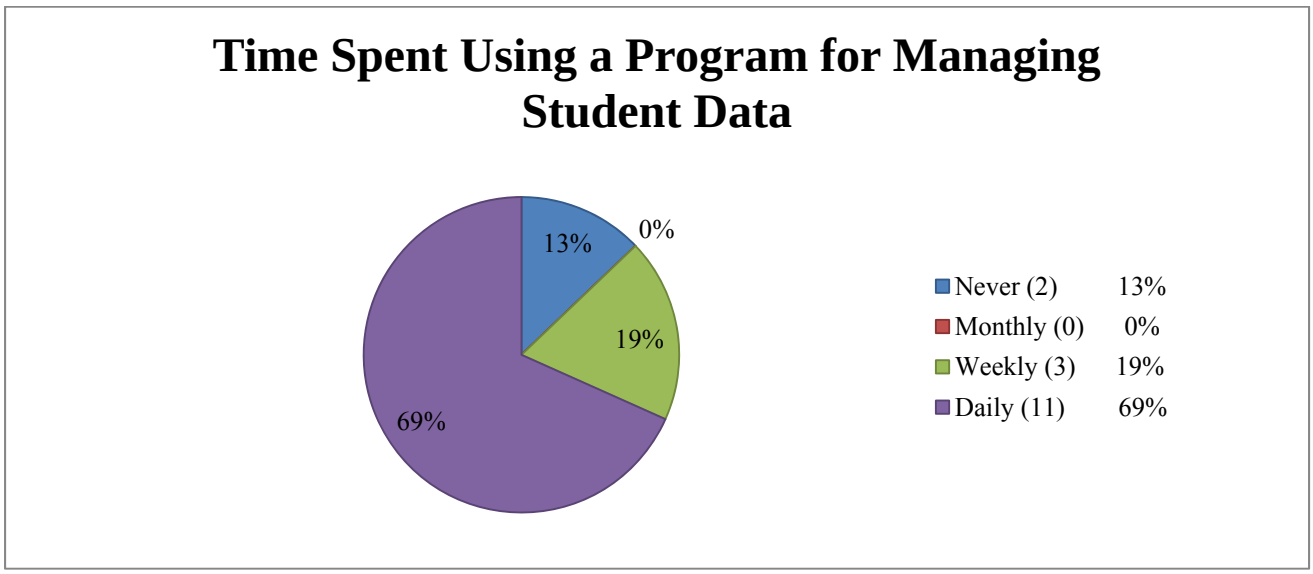



Table 13 shows the amount of time teachers spend using Excel Spreadsheet. The same number of teachers responded to using Excel Spreadsheet with 6 (38%) teachers using it on a

monthly basis and 6 (38%) using it on a weekly basis. 1 (6%) teacher noted using it daily, and 3 (19%) teachers stated that they never use the Excel spreadsheet program.

*Table 14*

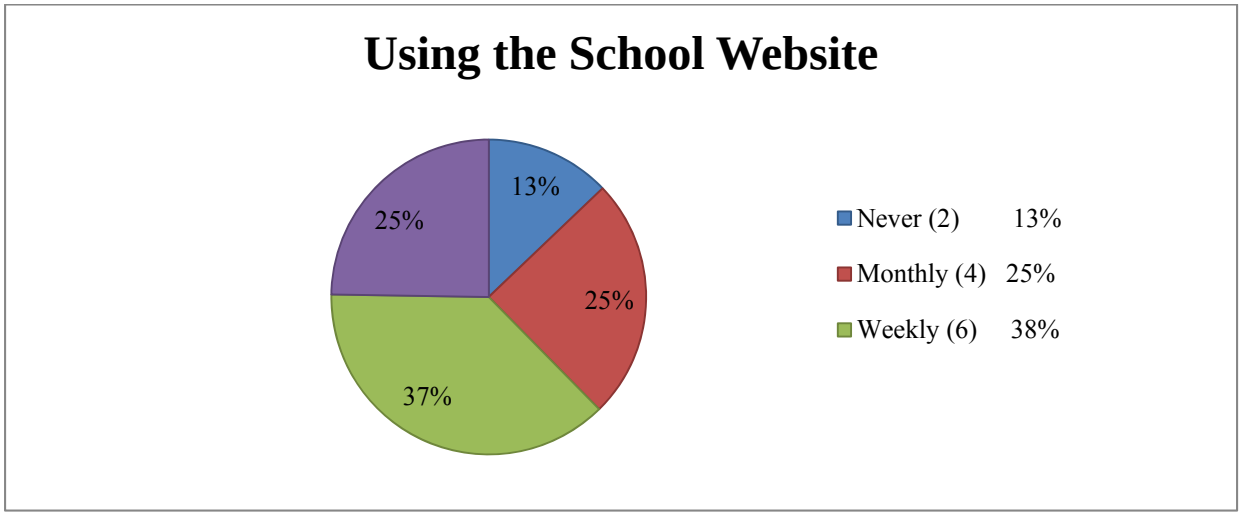
Question: How much time do you spend using a program for management of student data?




The graph in Table 14 shows that again the largest number of teachers surveyed, 11 (69%) use a program for managing student data on a daily basis. 3 (19%) teachers use a program to manage student data on a weekly basis. 2 (13%) teachers said that they never use a program to manage student data, and 0 (0%) teachers responded to using a program to manage student data on a monthly basis.

*Table 15*

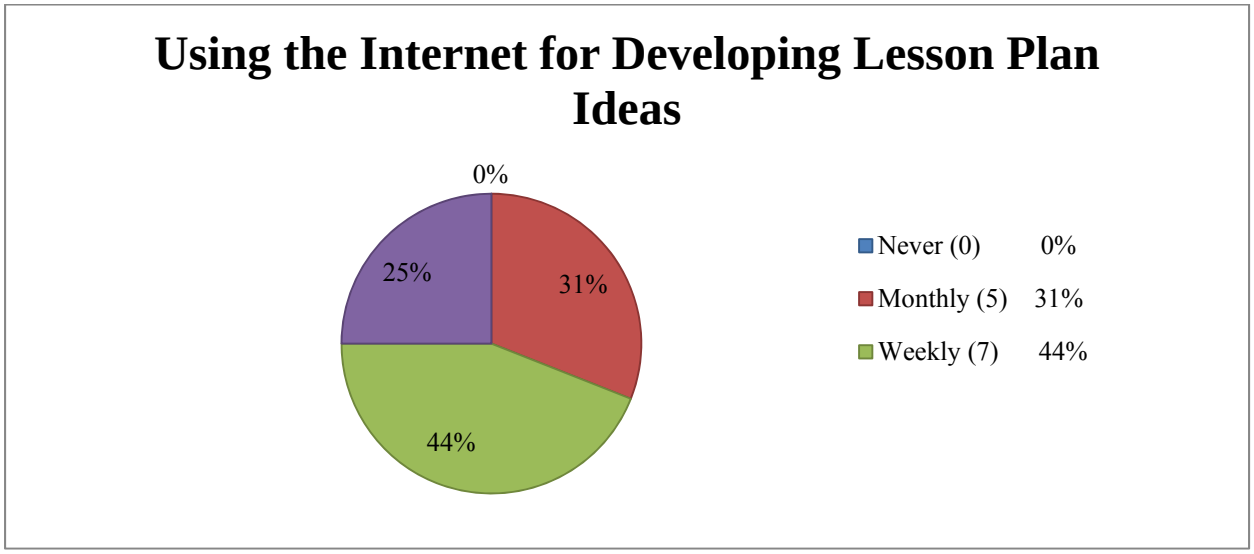
Question: How often do you use the school website?




As shown in the graph in Table 15, 6 (38%) of the teachers surveyed use the school website weekly. The same number of teachers responded to using the school website both monthly and daily with 4 (25%) teachers using it monthly, and 4 (25%) teachers using it daily. 2 (13%) teachers stated that they never use the school website.

*Table 16*

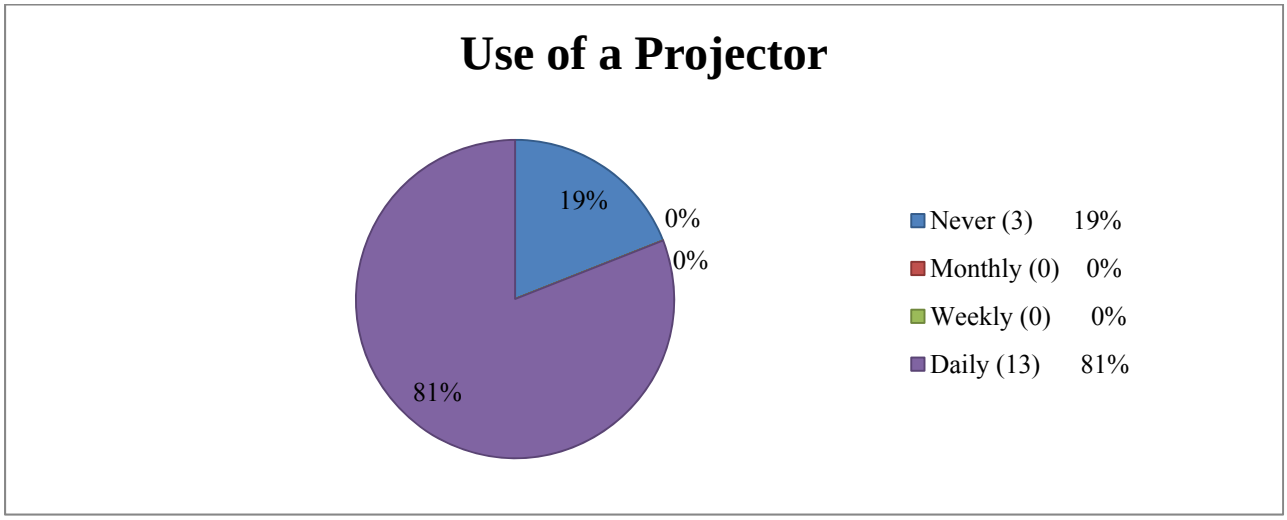
Question: How often do you use the internet for developing lesson plans?




The graph in Table 16 shows how often the teachers that were surveyed use the internet for the development of lesson plan ideas. 7 (44%) teachers stated that they use the internet weekly to help with coming up with ideas for lessons. 5 (31%) teachers stated that they used the internet monthly for lesson plan ideas. 4 (25%) teachers indicated that they use the internet daily for ideas for lessons, and 0 (0%) teachers did not use the internet at all for lesson planning.

*Table 17*

Question: How often do you use your projector?




The graph in Table 17 represents how often classroom and special content area teachers use their projector. 0 (0%) teachers responded to monthly and weekly usage of the projector. The largest number of teachers, 13 (81%) did use their projector daily. Only 3 (19%) teachers stated that they never use a projector.

*Table 18*

Question: How often do you use a Smart Board?

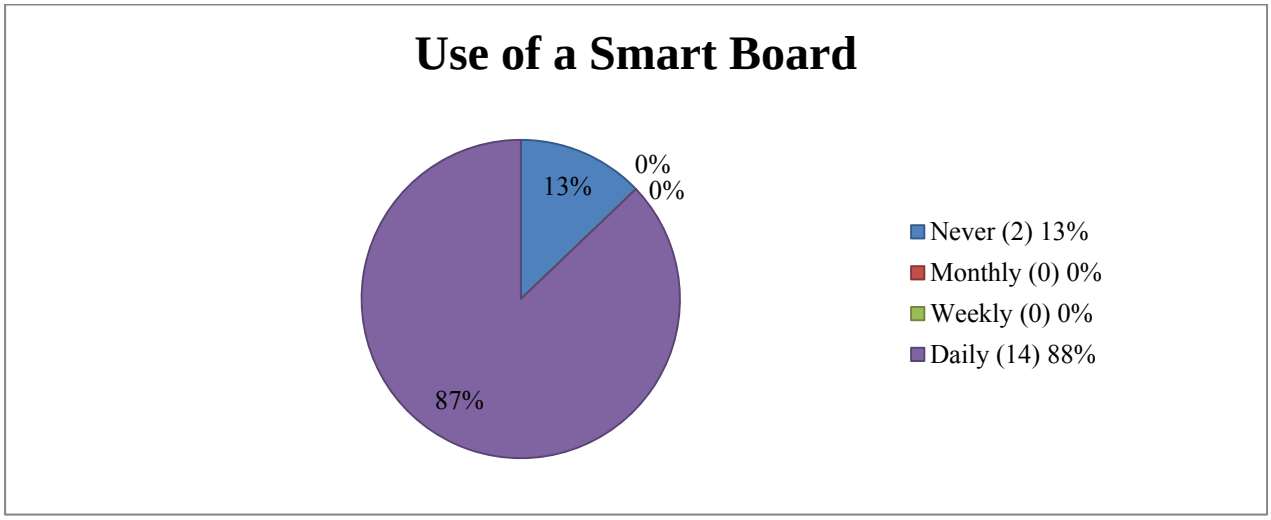



Table 18 shows how frequently teachers use a Smart Board for instruction. 14 (88%) out of 16 (100%) teachers indicated that they use a Smart Board for instruction daily. 2 (13%) stated that they never use a Smart Board for instruction. 0 (0%) teachers responded to using a Smart Board monthly or weekly for instruction.

The next section of the survey asked for teachers' general attitudes and opinions towards technology and their role in education now and in the future. These questions pertained to student and teacher usage. The following graphs and tables show the responses from all 16 teachers surveyed.

*Table 19*

Question: When using the internet do students produce projects that reflect higher levels of learning?

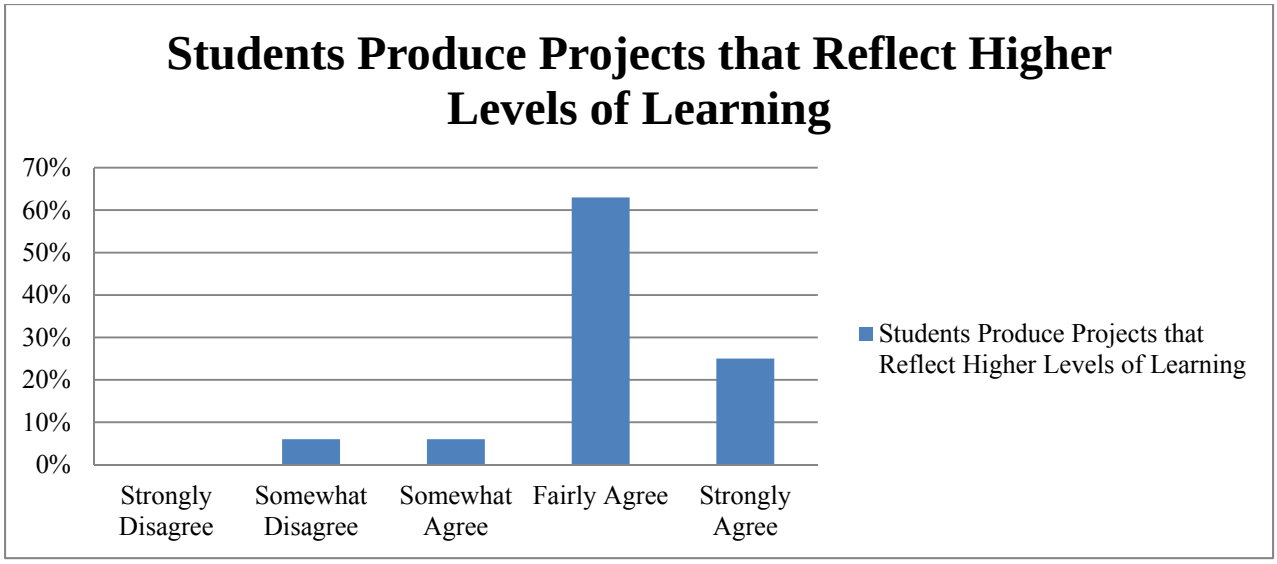



Table 19 reflects the opinion of teachers as to whether or not they feel that technology helps students produce projects that reflect higher levels of learning. There were 0 (0%) teachers that strongly disagreed with this opinion. 1 (6%) teacher somewhat disagree with this opinion and 1(6%) teacher agreed with the opinion. The largest number of teachers, 10 (63%) fairly agreed that technology helps students produce projects that reflect higher levels of learning and 4 (25%) strongly agreed with this opinion.

*Table 20*

Question: When students use the internet are there more discipline problems?

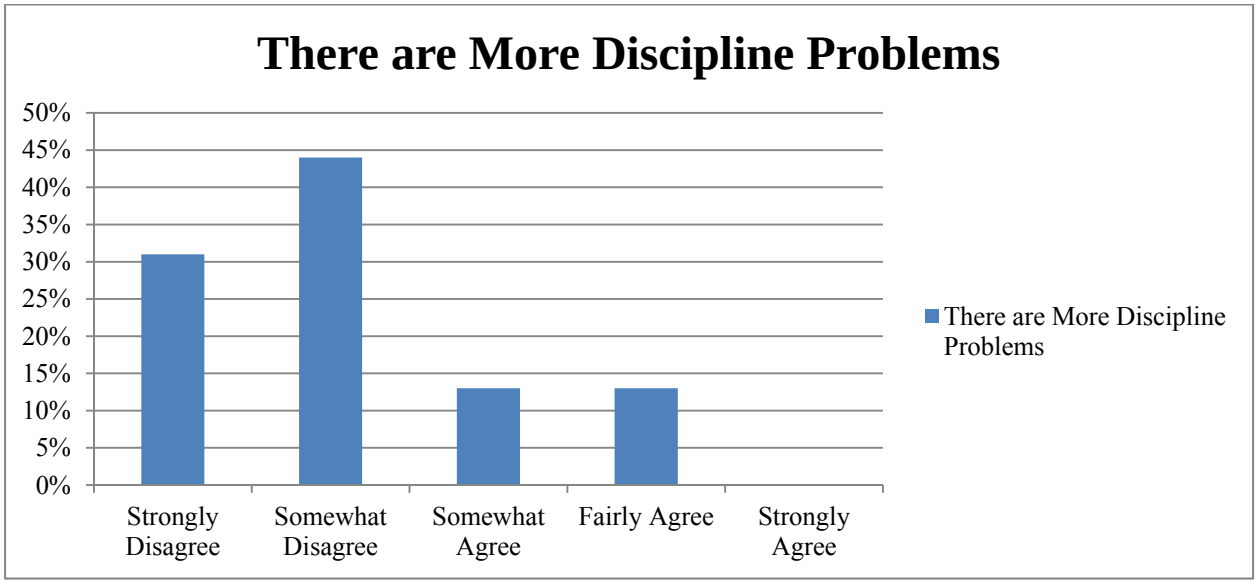



Table 20 addresses the internet and correlating discipline problems. Most of the teachers, 7 (44%) somewhat disagree with the opinion that when students use the internet there tend to be more discipline problems. At the same time, 5 (31%) teachers strongly disagree that there tend to be more discipline problems when students use the internet. 2 (13%) teachers somewhat agreed with this opinion and 2 (13%) teachers also fairly agreed with this opinion. There were 0 (0%) teachers that strongly agreed that there are more discipline problems when students use the internet.

*Table 21*

Question: When students use the internet is there more student collaboration?

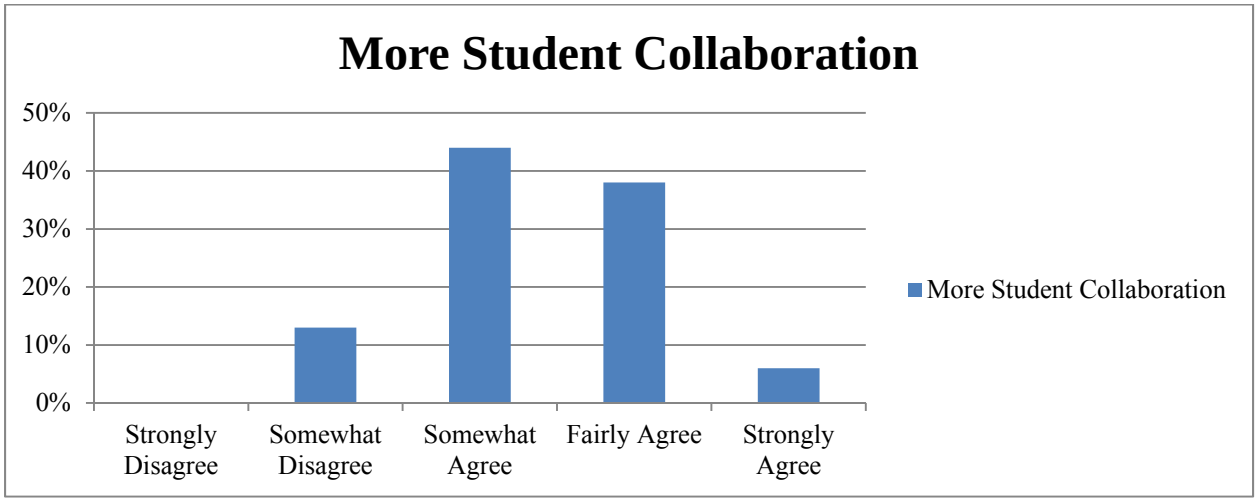
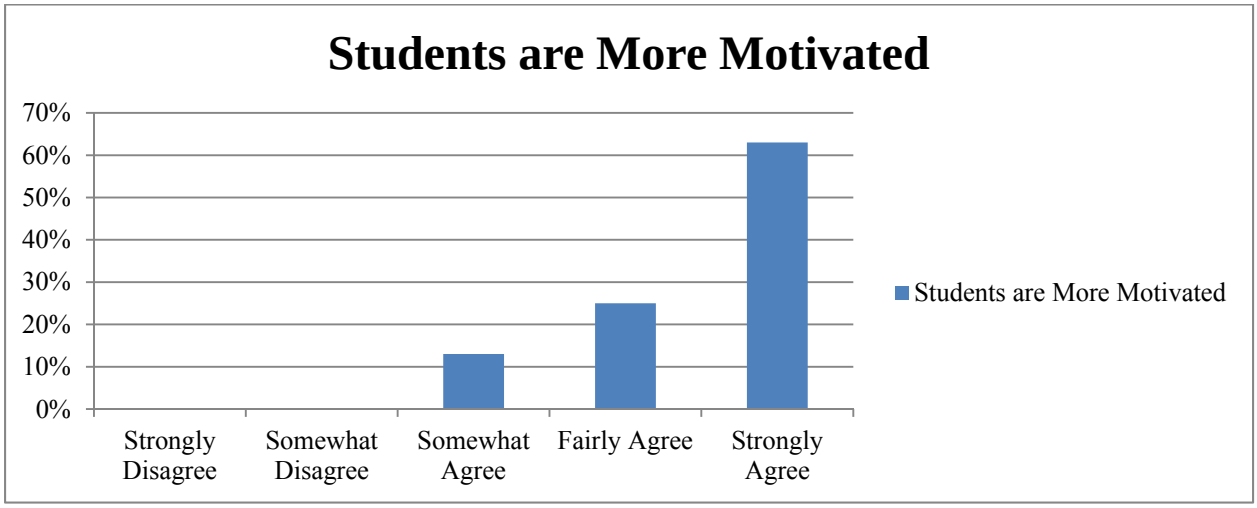



Table 21 shows the opinion of teachers and student internet usage when it comes to student collaboration. The largest number of teachers, 7 (44%), somewhat agree that there is more student collaboration when students use the internet. 6 (38%) teachers fairly agree with this opinion, and 1 (6%) teacher strongly agrees that there is more student collaboration when students use the internet. On the other hand, while 0 (0%) teachers strongly disagree with this 2 (13%) teachers did somewhat disagree that there is more student collaboration when students use the internet.

*Table 22*

Question: When using technology are students more motivated?




As shown in Table 22, the majority of teachers surveyed, 10 (63%) strongly agree that students are more motivated to learn when they use technology. 4 (25%) fairly agree that students are more motivated to learn when they use technology, and the remaining 2 (13%) teachers somewhat agreed with this opinion. 0 (0%) teachers responded to somewhat disagreeing or strongly disagreeing with this opinion.

*Table 23*

Question: Are information resources from the internet reliable for the most part?

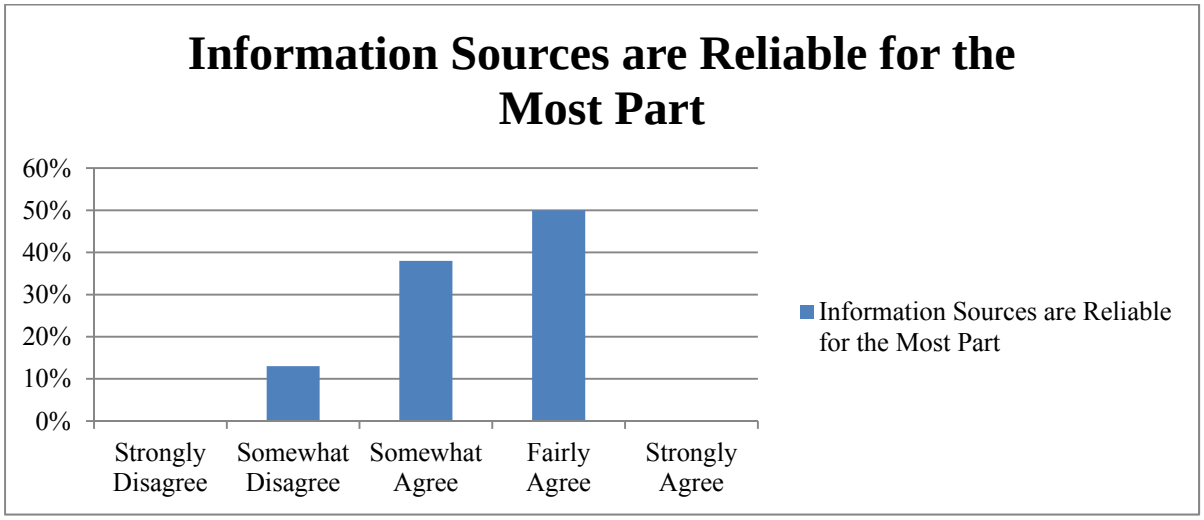



Table 23 shows the results of the question whether or not teachers found that information resources from the internet are reliable for the most part. 0 (0%) teachers neither strongly disagreed nor strongly agreed that information resources from the internet are reliable for the most part. The largest response from teachers showed that ½ or 8 (50%) teachers fairly agreed with this opinion. 6 (38%) teachers somewhat agreed that information sources from the internet are reliable for the most part. 2 (23%) teachers somewhat disagreed with this opinion and 0 (0%) teachers strongly disagreed.

*Table 24*

Question: Do you believe that most technology improves your ability to teach?

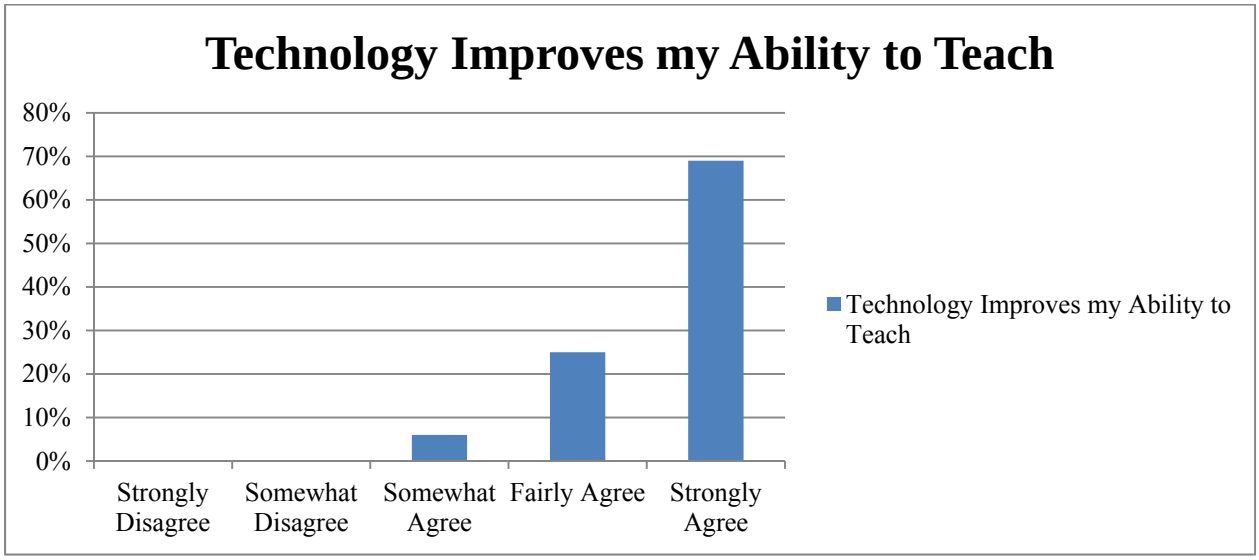



Table 24 shows the results of how many teachers actually feel that most technology improves their ability to teach. 11 (69%) out of 16 (100%) strongly agree that most technology does help their ability to teach. 4 (25%) teachers fairly agree with this opinion and 1 (6%) somewhat agreed. There were 0 (0%) teachers that somewhat disagreed or strongly disagreed that most technology improves their ability to teach.

*Table 25*

*Summary of ANOVA Test of Significance Results for Years of Experience and Teaching Improvement with the use of Technology*

| Source | SS | df | MS | F | P-Value |
|---|---|---|---|---|---|
| Does Technology Improve my Teaching? | 2.86 | 11 | .26 | | |
| Years of Experience | 2.89 | 4 | .72 | 2.78 | 0.08 |

Sig <= 0 .25

After dividing up all of the teachers surveyed into five groups of years of teaching experience, an ANOVA test was performed to test the difference of opinion among the teachers based on the number of years that they had taught. The data collected indicating the opinion whether technology does in fact improve the teachers current teaching ability is demonstrated by the sum of squares (SS) as 2.86. The degree of freedom (df) was 11. The mean square (MS) was .26. The Fisher (F) was 2.78, and the significance (P-Value) was 0.08. The null hypothesis is rejected for this question. There is a significant difference among teachers based on years of experience regarding the use of technology and best practices. A follow up summary Post Hoc Analysis was done with the same group of teachers to determine if the difference of opinion was enough to propose that the number of years of experience makes a difference as to whether elementary teachers at SE support technology as a best practice.

*Table 26*

*Summary Post Hoc Analysis Results of Years of Experience and Teaching Improvement with the use of Technology*

| Years of Experience | Years of Experience | Mean D | Std. Error | p-value |
|---|---|---|---|---|
| 1-5 Years | 6-10 Years | -2.22 | 0.59 | 1.0 |
| 1-5 Years | 11-15 Years | 1.43 | 0.54 | 0.79 |
| 1-5 Years | 16-20 Years | 1.0 | 0.57 | 0.11 |
| 1-5 Years | 21+ Years | 1.0 | 0.72 | 0.19 |
| 6-10 Years | 11-15 Years | 1.43 | 0.35 | 0.69 |
| 6-10 Years | 16-20 Years | 1.0 | 0.39 | 0.03 |
| 6-10 Years | 21+ Years | 1.0 | 0.59 | 0.12 |
| 11-15 Years | 16-20 Years | 8.57 | 0.31 | 0.02 |
| 11-15 Years | 21+ Years | 8.57 | 0.54 | 0.14 |
| 16-20 Years | 21+ Years | 2.05 | 0.57 | 1.0 |

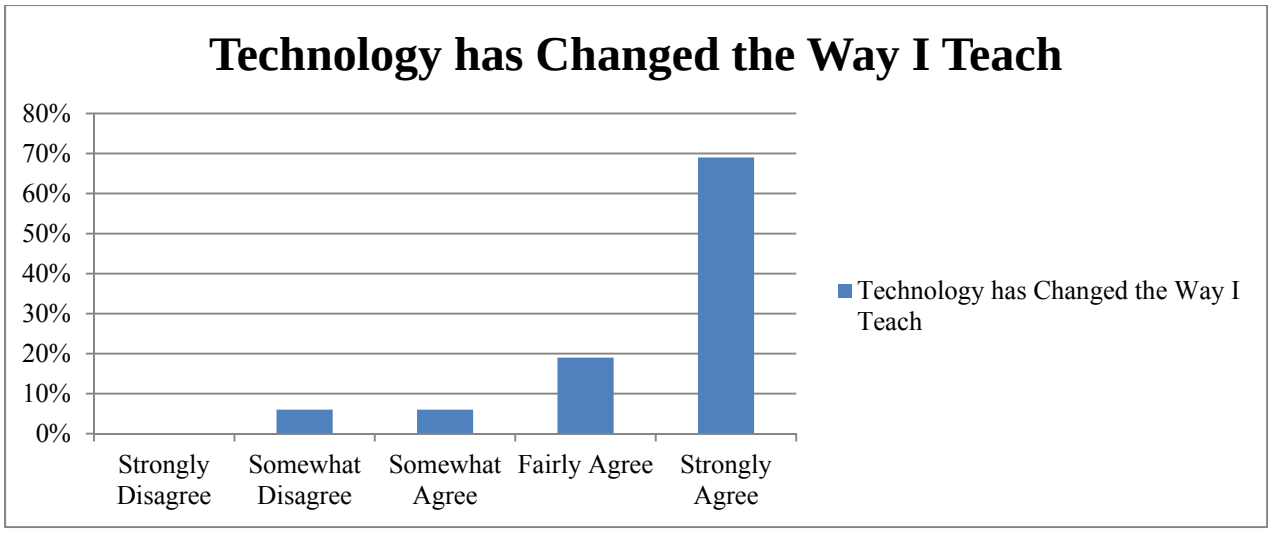
Sig <= 0.25

As shown in table 26, there was not a significant difference (Mean D = -2.22, SD = 0.59, p-value=1.0) among teachers with between group 1 with 1-5 years of experience and group 2 with 6-10 years of experience. There was also not a significant difference (Mean D = 1.43, SD = 0.54, p-value=0.79) among teachers between group 1 with 1-5 years of experience and group 3 with 11-15 years of experience. There was a significant difference however (Mean D = 1.0, SD = 0.57, p-value = 0.19) between teachers with group 1 with 1-5 years of experience and group 4 with 16-20 years of experience. There was also a significant difference (Mean D = 1.0, SD = 0.72, p-value=0.19) between teachers with group 1 with 1-5 years of experience and group 5 with 21+ years of experience. Again, there was not a significant difference (Mean D = 1.43, SD = 0.35, p-value=0.69) between teachers with group 2 with 6-10 years of experience and group 3 with 11-15 years of experiences. There was a significant difference again though (Mean D = 1.0, SD = 0.39, p-value=0.03) between group 2 with 6-10 years of experience and group 4 with 16-20 years of experience. There was a significant difference (Mean D = 1.0, SD = 0.59, p-value=0.12) between group 2 with 6-10 years of experience and group 5 with 21+ years of

experience. There was also a significant difference (Mean D = 8.57, SD = 0.54, p-value=0.02) among group 3 with 11-15 years of experience and group 4 with 16-20 years of experience. The next groups also showed significant difference (Mean D = -8.57, SD = 0.54, p-value=0.14) among group 3 with 11-15 years of experience and group 5 with 21+ years of experience. The final group did not show a significant difference (Mean D = 2.05, SD = 0.57, p-value=1.0) among group 4 with 16-20 years of experience and group 5 with 21+ years of experience.

*Table 27*

Question: Do you believe that technology has changed the way you teach?




As shown in Table 27, 11 (69%) teachers strongly agree that technology has changed the way they teach in the classroom. 3 (19%) teachers fairly agree that technology has changed the way they teach in the classroom. 1 teacher (6%) somewhat agreed with this opinion, while 1 (6%) teachers somewhat disagreed with this opinion. 0 (0%) teachers strongly disagreed that technology has changed the way they teach.

*Table 28*

*Summary of ANOVA Test of Significance Results for Years of Experience and Teaching Change with the use of Technology*

| Source | SS | df | MS | F | P-Value |
|---|---|---|---|---|---|
| Has Technology Changed the way I Teach? | 5.61 | 11 | .51 | | |
| Years of Experience | 6.39 | 4 | 1.6 | 3.14 | 0.06 |

Sig <= 0 .25

After dividing up all of the teachers surveyed into five groups of years of teaching experience, an ANOVA test was performed to test the difference of opinion among the teachers based on the number of years that they had taught. The data collected indicating the opinions whether technology has changed the way teachers currently teach is demonstrated by the sum of squares (SS) as 5.61. The degree of freedom (df) was 11. The mean square (MS) was .51. The Fisher (F) was 3.14, and the significance (P-Value) was 0.06. The null hypothesis is rejected for this question. There is a significant difference among teachers based on years of experience regarding the use of technology and best practices. A follow up summary Post Hoc Analysis was done with the same group of teachers to determine if the difference of opinion was enough to propose that the number of years of experience makes a difference as to whether elementary teachers at SE support technology as a best practice.

*Table 29*

*Summary Post Hoc Analysis Results of Years of Experience and Teaching Change with the use of Technology*

| Years of Experience | Years of Experience | Mean D | Std. Error | p-value |
|---|---|---|---|---|
| 1-5 Years | 6-10 Years | -2.22 | 0.82 | 1.0 |
| 1-5 Years | 11-15 Years | 1.43 | 0.76 | 0.85 |
| 1-5 Years | 16-20 Years | 1.25 | 0.80 | 0.15 |
| 1-5 Years | 21+ Years | 2.0 | 1.01 | 0.74 |
| 6-10 Years | 11-15 Years | 1.43 | 0.49 | 0.78 |
| 6-10 Years | 16-20 Years | 1.25 | 0.55 | 0.04 |
| 6-10 Years | 21+ Years | 2.0 | 0.82 | 0.03 |
| 11-15 Years | 16-20 Years | 1.11 | 0.44 | 0.03 |
| 11-15 Years | 21+ Years | 1.86 | 0.76 | 0.03 |
| 16-20 Years | 21+ Years | 7.50 | 0.79 | 0.37 |

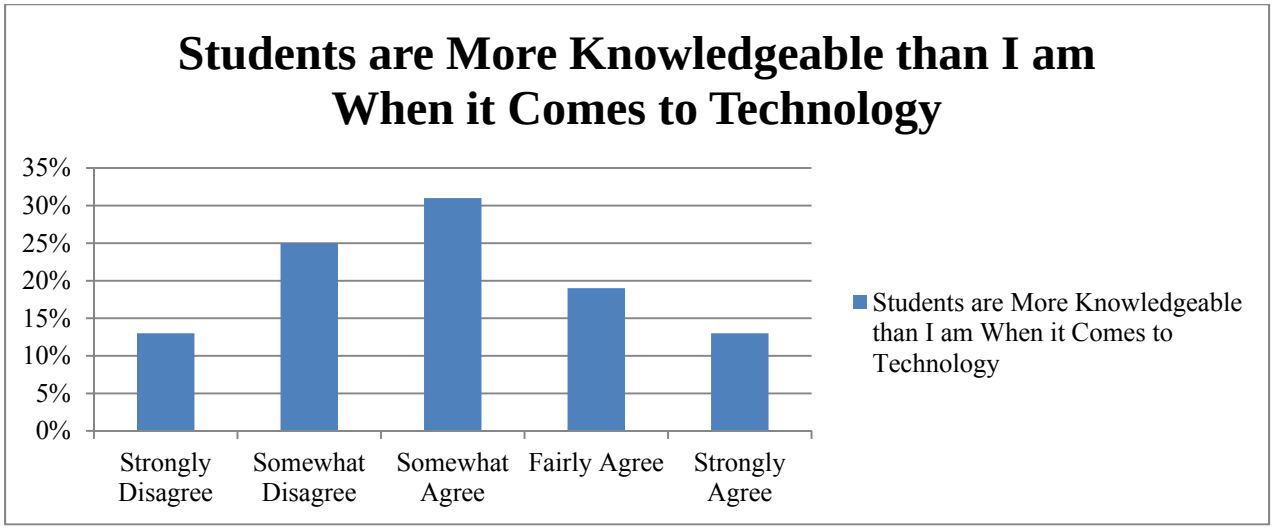
Sig <= 0.25

As shown in table 29, there was not a significant difference (Mean D = -2.22, SD = 0.82, p-value=1.0) among teachers with between group 1 with 1-5 years of experience and group 2 with 6-10 years of experience. There was also not a significant difference (Mean D = 1.43, SD = 0.76, p-value=0.85) among teachers between group 1 with 1-5 years of experience and group 3 with 11-15 years of experience. There was a significant difference however (Mean D = 1.25, SD = 0.79, p-value = 0.14) between teachers with group 1 with 1-5 years of experience and group 4 with 16-20 years of experience. There was a significant difference (Mean D = 2.0, SD = 1.01, p-value=0.07) between teachers with group 1 with 1-5 years of experience and group 5 with 21+ years of experience. Again, there was not a significant difference (Mean D = 1.43, SD = 0.49, p-value=0.78) between teachers with group 2 with 6-10 years of experience and group 3 with 11-15 years of experiences. There was a significant difference again though (Mean D = 1.25, SD = 0.54, p-value=0.04) between group 2 with 6-10 years of experience and group 4 with 16-20 years of experience. There was a significant difference (Mean D = 2.0, SD = 0.82, p-value=0.03) between group 2 with 6-10 years of experience and group 5 with 21+ years of experience. There

was also a significant difference (Mean D = 1.10, SD = 0.45, p-value=0.03) among group 3 with 11-15 years of experience and group 4 with 16-20 years of experience. The next groups also showed significant difference (Mean D = -1.86, SD = 0.76, p-value=0.03) among group 3 with 11-15 years of experience and group 5 with 21+ years of experience. The final group did not show a significant difference (Mean D = 7.50, SD = 0.80, p-value=0.37) among group 4 with 16-20 years of experience and group 5 with 21+ years of experience.

*Table 30*

Question: Do you believe that students are more knowledgeable than you when it comes to technology?




As displayed in Table 30, 5 (31%) teachers surveyed somewhat agree that students are more knowledgeable about technology than they are as teachers. 2 (13%) strongly agree with this statement, and 2 (13%) teachers strongly disagree with this statement. 4 (25%) teachers somewhat disagree that students are more knowledgeable than they are when it comes to technology usage, and 3 (19%) teachers fairly agree with this opinion.

*Table 31*

Question: Do you believe that technological change is coming too fast without enough support for teachers?

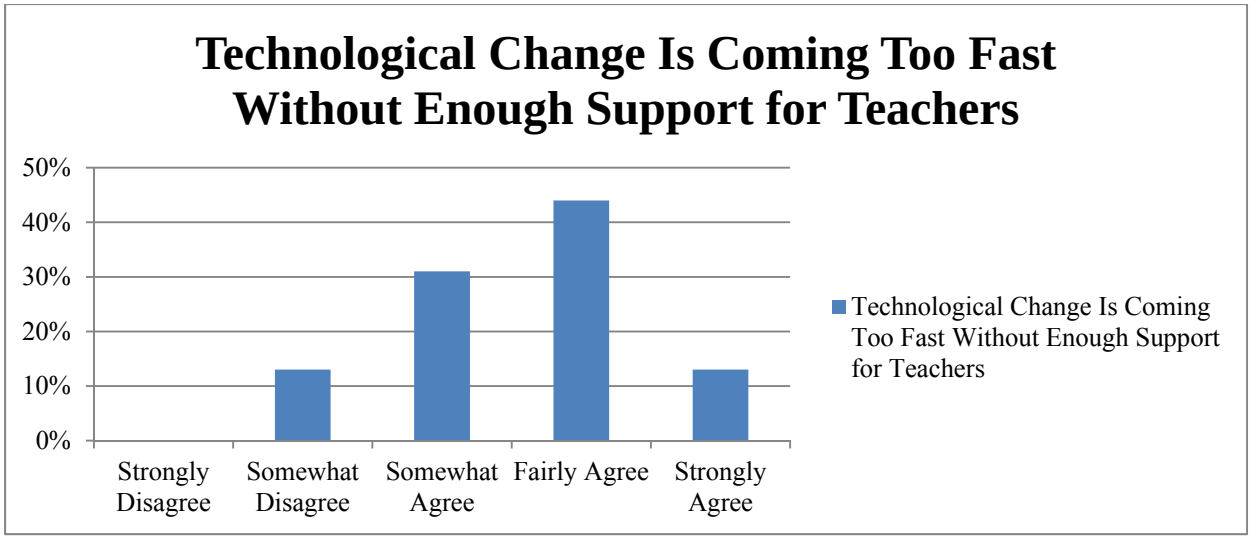



Table 31 displays the results of how teachers feel regarding technological change and support. 7 (44%) teachers fairly agree that technological change is coming way too fast without enough support for teachers. 5 (31%) teachers somewhat agree that technological change is coming faster than it can be supported. 2 (13%) teachers somewhat disagree with this opinion while 2 (13%) also strongly agreed with it. There were 0 (0%) teachers that strongly disagreed with this opinion.

*Table 32*

Question: Do you believe that technology is a good collaboration tool for teachers?

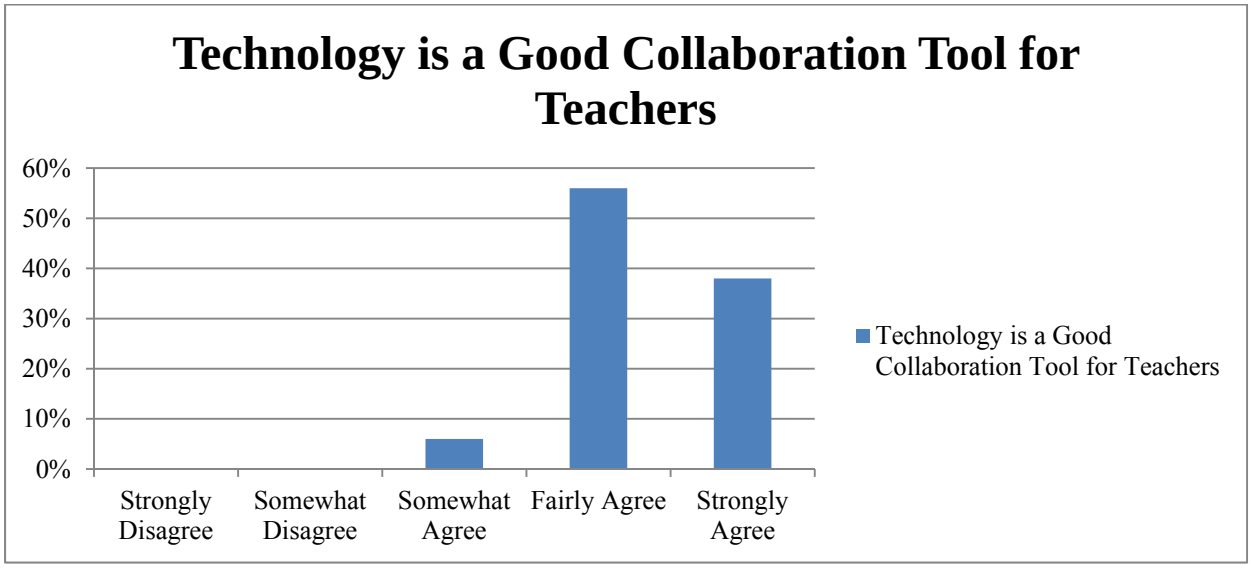



Table 32 shows that most of the teachers surveyed 9 (56%), fairly agree that technology is a good collaboration tool for teachers. 6 (38%) strongly agree with this opinion. 1 (6%) teacher somewhat agreed that technology is a good collaboration tool for teachers. There were 0 (0%) responses in both categories strongly disagree and somewhat disagree.

*Table 33*

Question: Do you believe technology is useful in managing student data such as grades, test scores, and attendance?

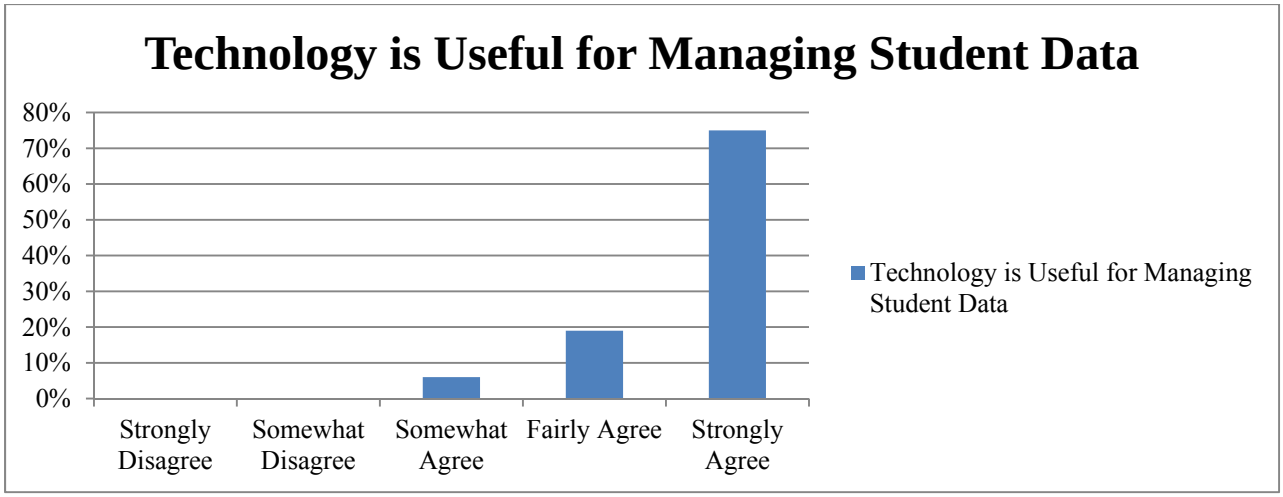



Table 33 shows the opinion teachers have about using technology for managing student data. Almost all of the teachers surveyed, 12 (75%), strongly agreed that technology is useful for managing student data. 3 (19%) teachers fairly agreed that technology is useful for managing student data, and 1 (6%) somewhat agreed. There were 0 (0%) teachers that neither somewhat disagreed or strongly disagree with this opinion.

*Table 34*

Question: Do you believe that technology is unreliable at times?

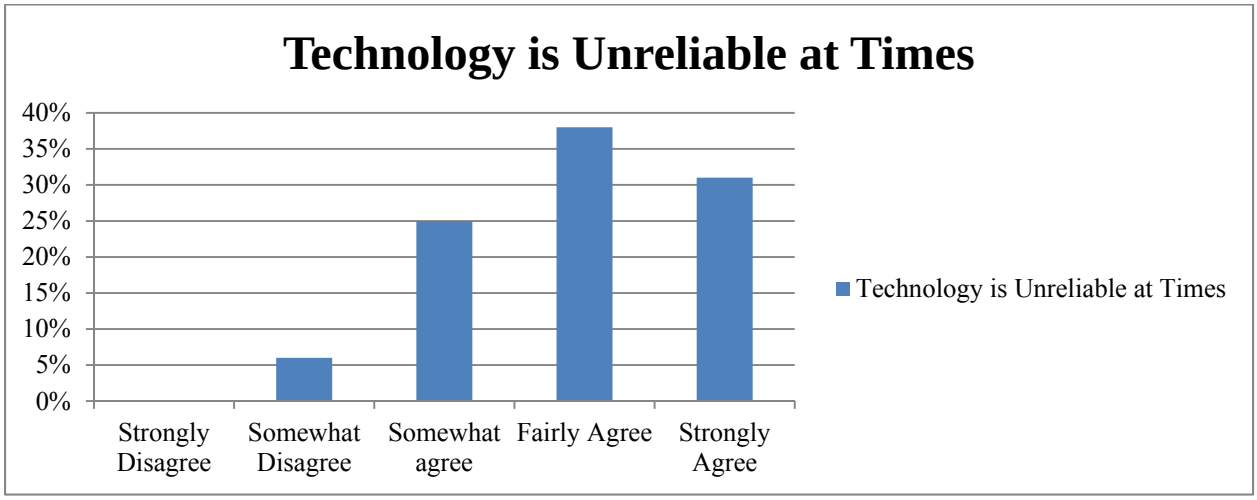



Table 34 shows that several teachers, 6 (38%), teachers fairly agree that technology is unreliable at times. 5 (31%) teachers strongly agree that technology is unreliable at times. 4 (25%) teachers somewhat agree that technology is unreliable at times and 1 (6%) somewhat disagrees with this opinion. There were 0 (0%) teachers that strongly disagreed that technology is unreliable at times.

*Table 35*

Question: Do you learn new technologies best by figuring them out on your own?

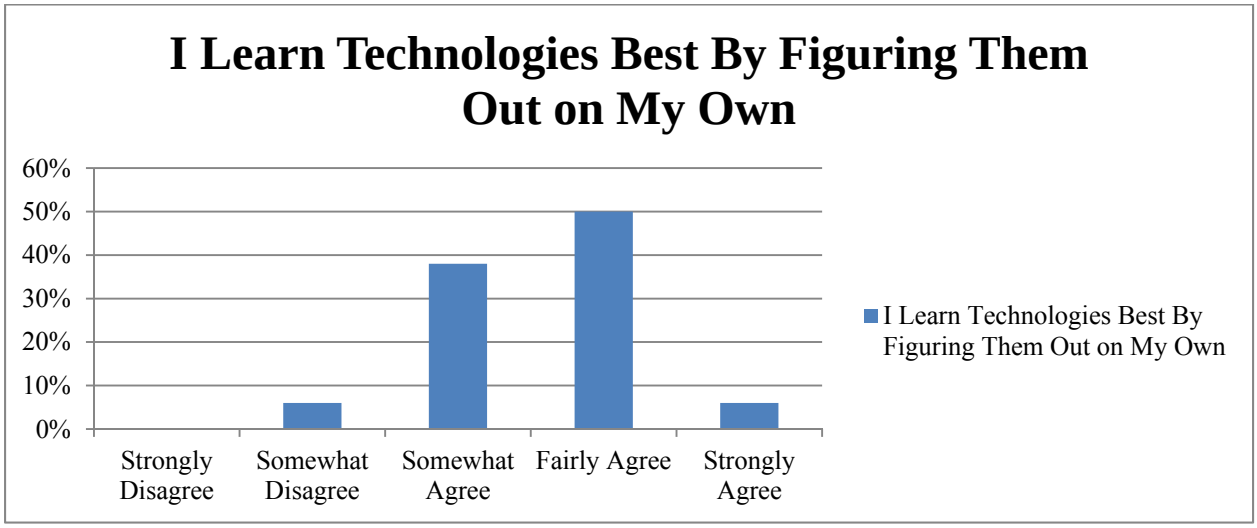



Table 35 shows that half of the teachers surveyed, 8 (50%), fairly agree that they learn technologies best by figuring them out on their own. 6 (38%) teachers somewhat agree that they learn technologies best by figuring them out on their own. 1 (6%) teacher strongly agreed with this statement, and 1 (6%) teacher somewhat disagreed with this statement. There were 0 (0%) teachers that strongly disagreed that they learn new technologies best by figuring them out on their own.

*Table 36*

Question: Do you require in-depth assistance in learning new technology programs and hardware?

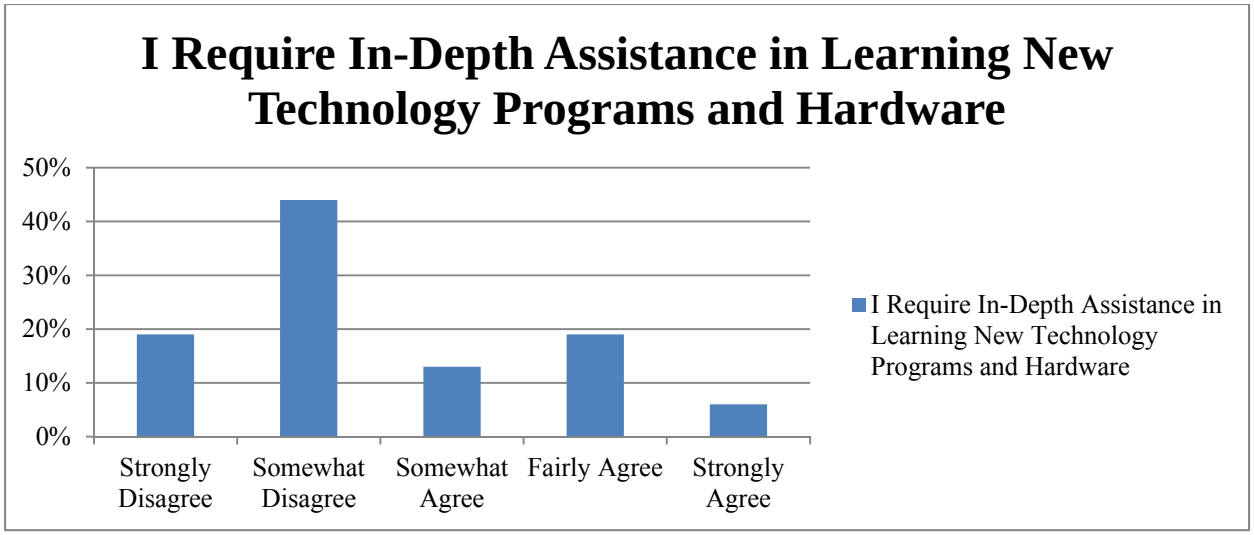



Table 36 shows a varying opinion among teachers that require in-depth assistance in learning new technology programs and hardware. In contrast to many of the other survey questions answered, the majority of responses, 7 (44%) strongly disagreed with the question asking if in-depth assistance was required in learning new technology programs and software. There were also 3 (19%) teachers that strongly disagreed with this question. 2 (13%) teachers somewhat agreed with the question and 3 (19%) fairly agreed with the question. Only 1 (6%) teachers strongly agreed that they require in-depth assistance in learning new technology programs and software.

*Table 37*

Question: Do you need more time to use the programs we have?

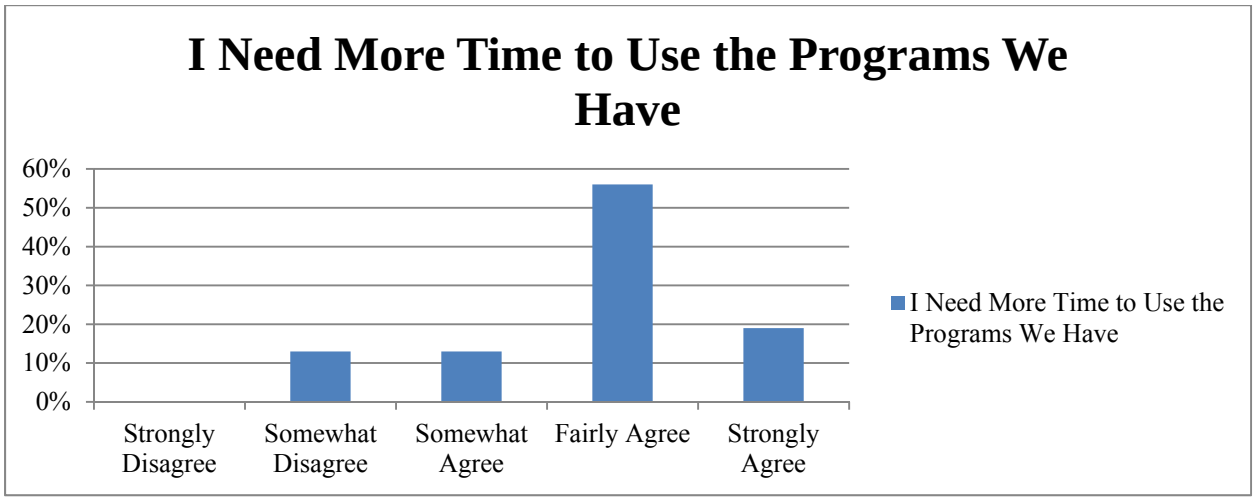



Table 37 shows that most of the teachers surveyed 9 (56%); fairly agree that they need more time to use the programs we currently have. 2 (13%) teachers somewhat agree that they need more time to use the programs we have. 5 (19%) teachers strongly agreed with this statement, and 2 (13%) teacher somewhat disagreed with this statement. There were 0 (0%) teachers that strongly disagreed that they need more time to use the programs we have.

*Table 38*

Question: Do you need more time to integrate technology into your lessons?

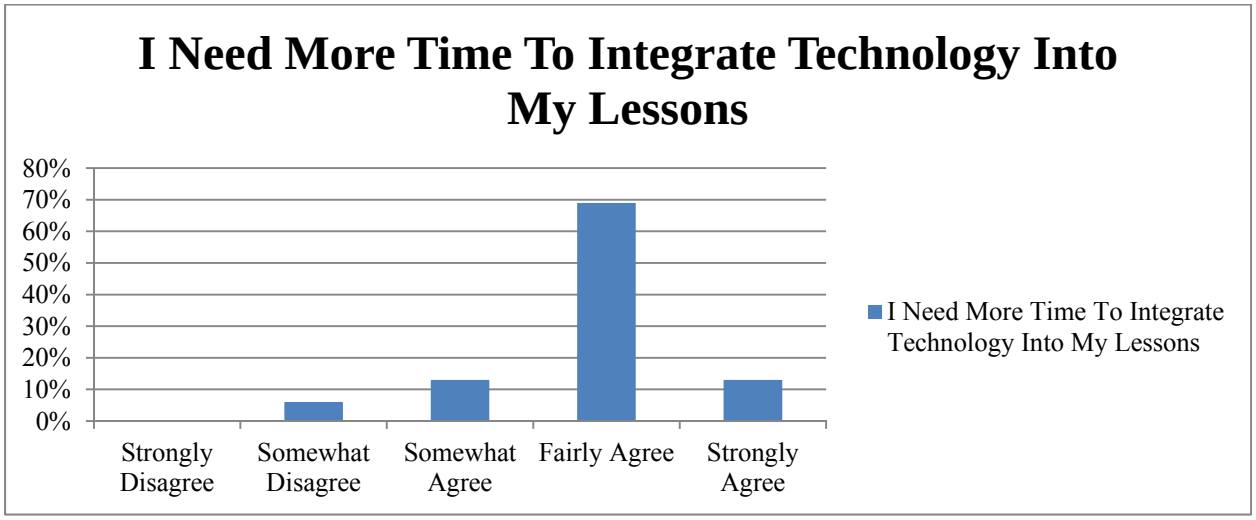



Table 38 shows that most of the teachers surveyed, 11 (69%), fairly agree that they need more time to integrate technology into my lessons. 2 (13%) teachers somewhat agree that they need more time to integrate technology into my lessons. 2 (13%) teachers strongly agreed with this statement, and 1 (6%) teacher somewhat disagreed with this statement. There were 0 (0%) teachers that strongly disagreed that they need more time to integrate technology into my lessons.

*Table 39*

Question: Do you need more technology training?

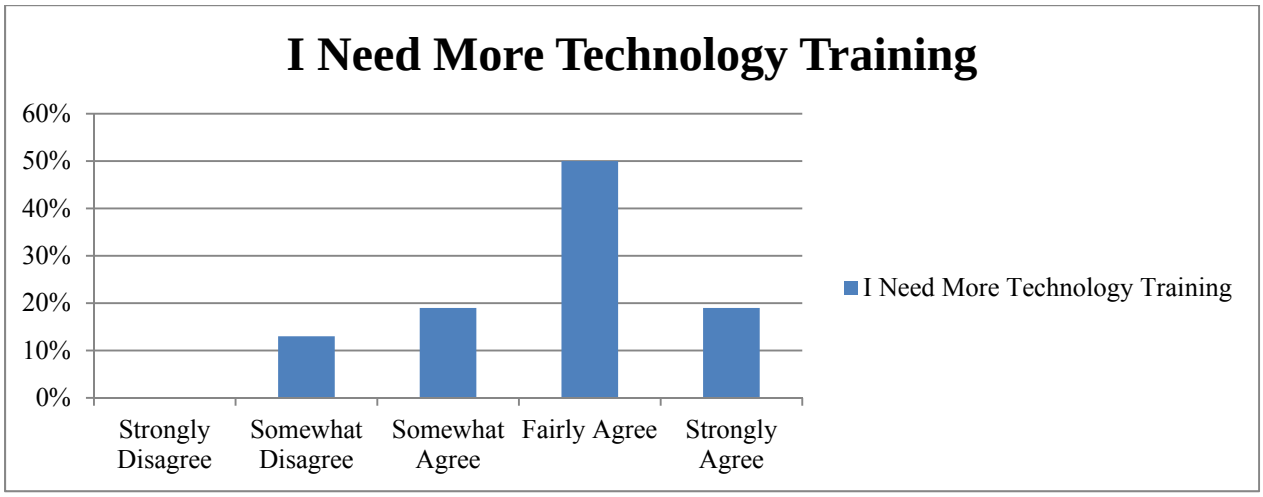



Table 39 shows that 1/2 of the teachers surveyed, 8 (50%), fairly agree that they need more technology training. 3 (19%) teachers somewhat agree that they need more technology training. 3 (19%) teachers strongly agreed with this statement, and 2(13%) teachers somewhat disagreed with this statement. There were 0 (0%) teachers that strongly disagreed that they needed more technology training.

*Table 40*

Question: Do you need more technology support when it comes to your technology needs?

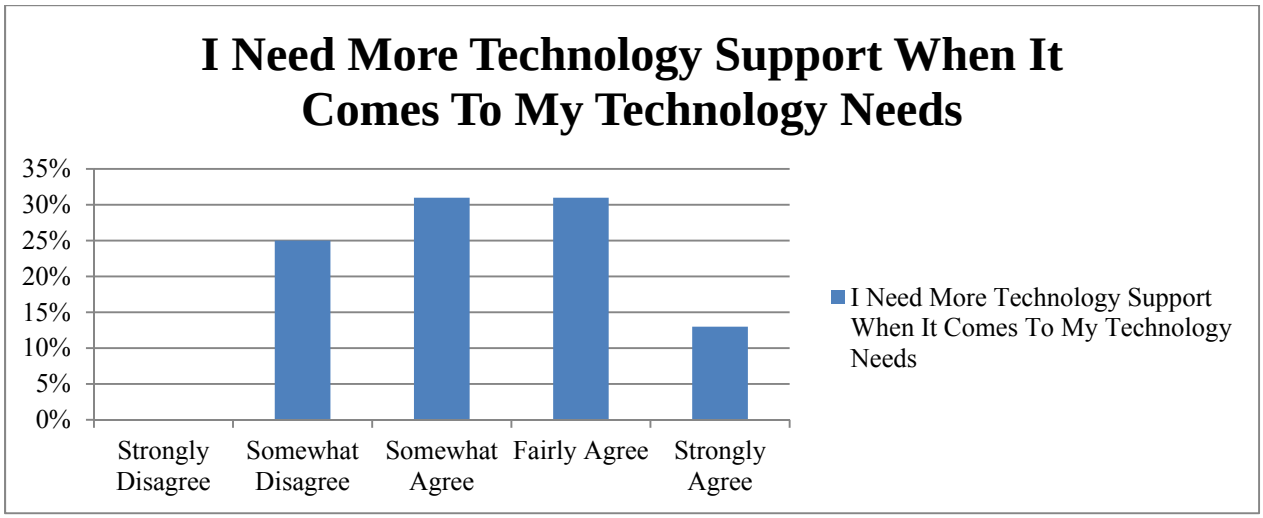



Table 40 shows that 5 (31%) of the teachers surveyed fairly agree that they need more technology support when it comes to technology needs, and 5(31%) teachers somewhat agree that they need more technology support when it comes to technology needs 2 (13%) teachers strongly agreed with this statement, and 4 (25%) teachers somewhat disagreed with this statement. There were 0 (0%) teachers that strongly disagreed that they need more technology support when it comes to technology needs.

*Table 41*

Question: Do you need more options for professional development in the areas of technology?

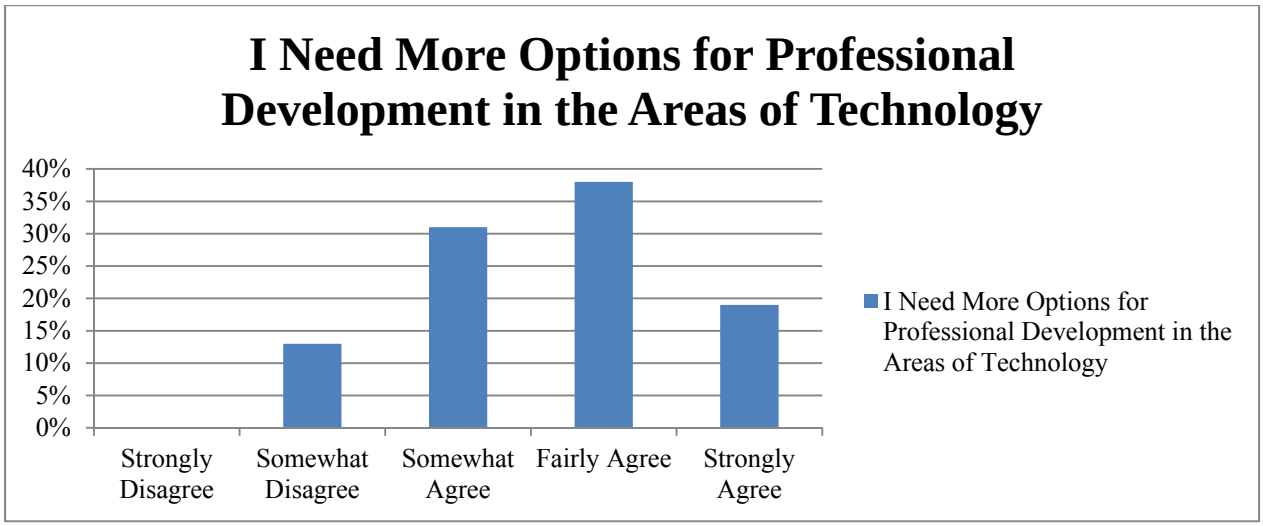



Table 41 shows that 6 (38%) of the teachers surveyed fairly agree that they need more options for professional development in the areas of technology. 5 (31%) teachers somewhat agree that they need more options for professional development in the areas of technology. 3 (19%) teachers strongly agreed that they needed more professional development options for technology, and 2 (13%) teachers somewhat disagreed with this opinion. There were 0 (0%) teachers that strongly disagreed that they need that they needed more professional development options for technology.

*Table 42*

Question: Do you need more opportunities to collaborate with teachers on how to integrate technology into curriculum?

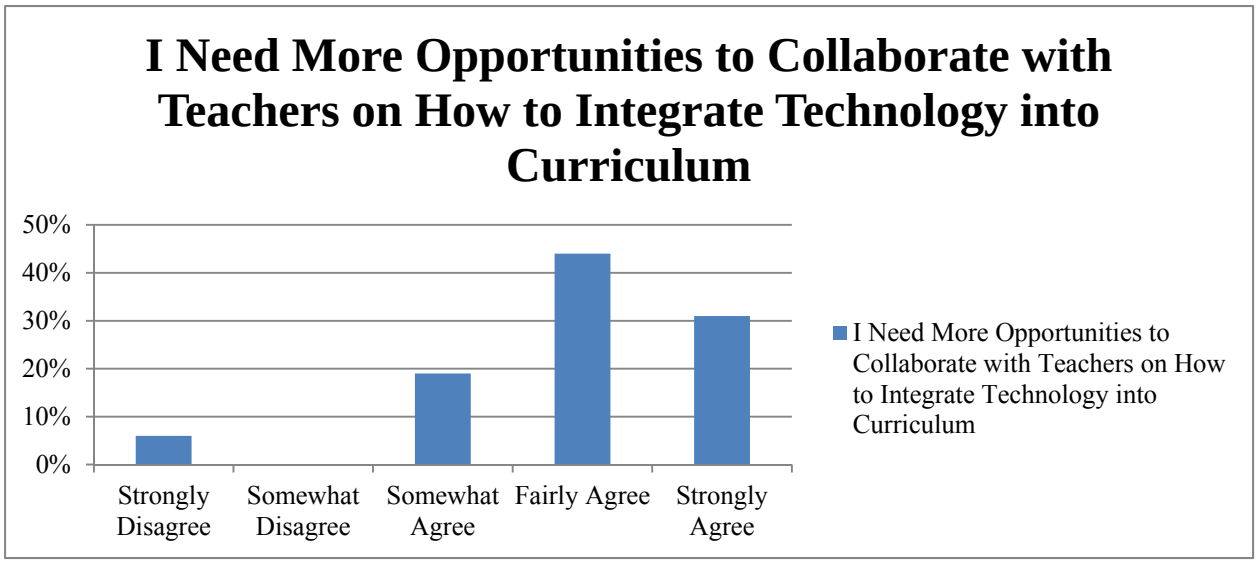



Table 42 shows that the majority of teachers surveyed, 7 (44%), of the teachers surveyed fairly agree that they need more opportunities to collaborate with teachers on how to integrate technology into curriculum. 3 (19%) teachers somewhat agree that they that they need more opportunities to collaborate with teachers on how to integrate technology into curriculum. 5 (31%) teachers strongly agreed that they that they need more opportunities to collaborate with teachers on how to integrate technology into curriculum, and 1 (6%) teachers strongly disagreed with this opinion. There were 0 (0%) teachers that somewhat disagreed that they need more opportunities to collaborate with teachers on how to integrate technology into curriculum.

*Table 43*

Question: Do you need tools to help you stay current on new technology trends?

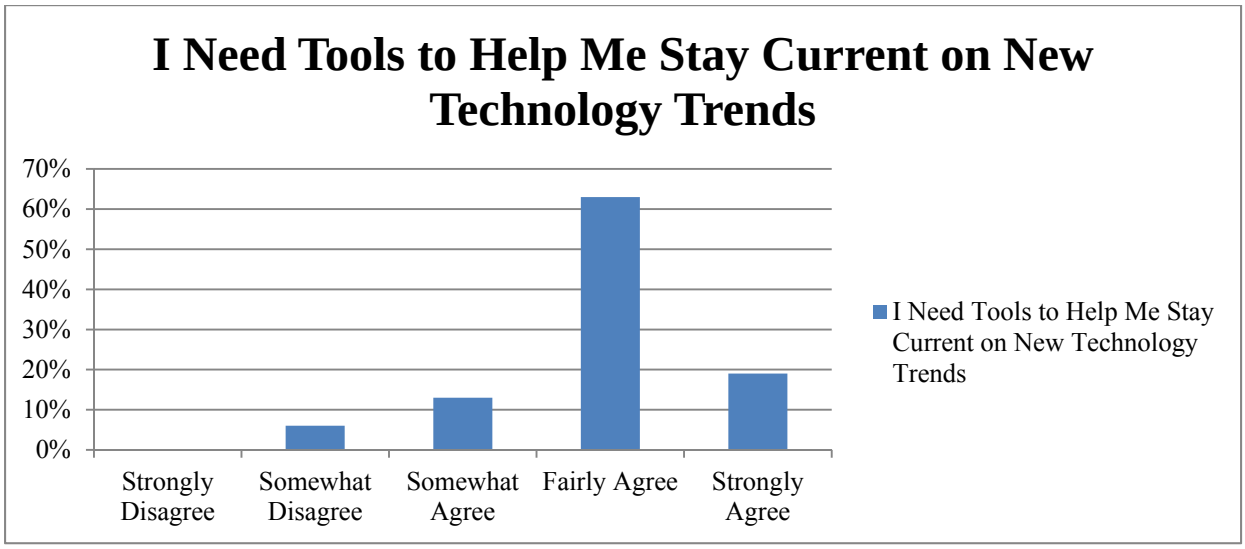
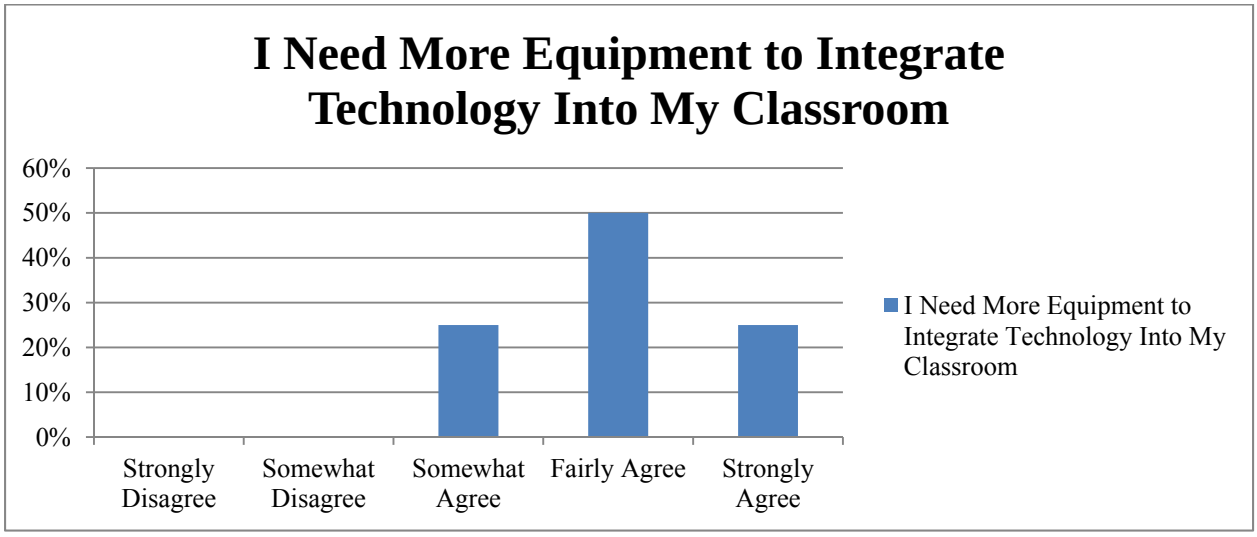



Table 43 shows that the majority of teachers surveyed 10 (63%) fairly agree that they need tools to help stay current on new technology trends. 1 (6%) teacher somewhat agreed that they that they need tools to help stay current on new technology trends. 3 (19%) teachers strongly agreed that they that they need tools to help stay current on new technology trends, and 1 (6%) teachers somewhat disagreed with this opinion. There were 0 (0%) teachers that somewhat disagreed that they need tools to help stay current on new technology trends.

*Table 44*

Question: Do you need more equipment to integrate technology?




As shown in Table 42 the majority of teacher responses, 7 (44%), of the teachers surveyed fairly agree that they need more equipment to integrate technology. 4 (25%) teachers somewhat agree that they that they need more equipment to integrate technology. 4 (25%) teachers also strongly agreed that they need more equipment to integrate technology. There were 0 (0%) teachers that either somewhat disagreed or 0 (0%) that strongly disagreed that they need more opportunities to collaborate with teachers on how to integrate technology into curriculum.

## Conclusions and Recommendations

In this study, the null hypothesis stated that there is no difference of opinion among elementary classroom and special content area teachers based on the number of years of teaching experience regarding the use of technology and best practices in the elementary classroom. The results of the study however, indicate that there are capacities of significant difference in opinion among elementary classroom teachers and special content area teachers based on the number of years of teaching experience regarding the use of technology and best practices in the classroom. The responses to some of the survey questions were elicited by the number of years of teaching experience that the teacher had. The data collected showed that there was a significant difference in opinions between teachers with 1-5 years of experience and teachers with 16-20 years of experience. The data collected also showed there was a significant difference between teachers with 1-5 years of experience and teachers with 21+ years of experience. For the most part, according to the survey results, teachers that are concerned about implementing best practices in their classrooms also support technology use in the classroom.

In light of budget limitations, technology implementation in the elementary classroom at KSD has been a slow process over the past few years. As a result, the study was limited based on the types and amount of technology available to elementary teachers. As technology evolves and is implemented in the classroom further study may be merited to determine the needs of teachers and students in order to continue implementing technology as a best practice method.

Due to the small number of teachers surveyed, a further study is warranted to determine how the opinions of the remaining teachers in the district compare based on their level of teaching experience. A further study could also be justified to determine why teachers that have 16-20 years of experience and teachers with 21+ years of experience have different opinions than

teachers with a minimum of 1-5 years of experience. Most importantly, a district wide survey could be studied in order for the administration to consider all of the technology needs of the district at the elementary level.

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