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How is teacher self-efficacy and attitude toward technology affected by extended
intrusive training?

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Introduction

Technology has never been more available in America's public school classrooms than it is right now. According to the U.S. Department of Education Digest of Education Statistics, the number of K-12 public schools with internet access increased from 8% to 98% from 1995 to 2008 (Snyder & Dillow, 2011). During this same period, the average number of computers per school tripled and the ratio of students to instructional computer went from 6.6:1 to 3.1:1 (Snyder & Dillow, 2011). Not only is technology available to classrooms throughout America, but Delen and Bulut (2011) determined that use of ICT (Information and Communication Technologies) at home and at school had a positive effect on students' math and science scores. However, these positive results can only be realized if a teacher is willing to learn, to experiment and to use the technology in the classroom. Martin, Strother, Beglau, Bates, Reitzes and Culp (2010) found the greater a teacher's dedication to technology professional development, the higher the quality of lesson plans and the higher the achievement of their students.

Yet, some teachers are hesitant to use the available technology (Russell, O'Dwyer, Bebell & Tao, 2007). Lack of time, concerns about personal impact, lack of support from administration and lack of training/technical support are all reasons expressed by teachers as to why technology is not used more in their classrooms (Akengin, 2008; Benson, Farnsworth, Bahr, Lewis & Shaha, 2004; Donovan, Hartley & Strudler, 2007). In addition to the reasons that teachers readily give, use of technology in the classroom is determined in large part by the teacher's self-efficacy and attitude toward technology (Kumar, Rose & D'Silva, 2008). Self-efficacy has been defined as a person's belief in their own abilities (Bandura, 1997). As it pertains to this study, self-efficacy is the teacher's belief in their skills and confidence in using technology in the classroom. Attitude has been defined as how favorable or unfavorable a

teacher feels toward a behavior (Kumar, Rose & D'Silva, 2008). Martin and Kudláček (2010) add that attitude also consists of how favorable a person is to perform a behavior, or willingness to try. As it pertains to this study, attitude will refer to the favorable or unfavorable feelings teachers have toward the use of technology in the classroom and also how willing they may be to try. The greater self-efficacy a teacher has and the more positive attitude they possess toward technology, the greater the likelihood they will use technology (Kumar, Rose & D'Silva, 2008).

Being willing to use technology in the classroom (attitude) and being confident in their skills (self-efficacy) increase the chance teachers will use technology (Kumar, Rose & D'Silva, 2008). Therefore, it is important to understand what can be done to increase the self-efficacy and attitude of teachers toward technology so positive influences can be seen in the classroom. Studies have shown that initial training and on-going, or follow-up, training is instrumental in teachers achieving and maintaining the skill set, self-efficacy and positive attitudes toward technology (Levin & Wadmany, 2008; Mayo & Kajs, 2005). However, hectic schedules limit the training sessions that teachers are willing to actively seek. This researcher's study will explore the role that training has on the self-efficacy and attitude toward technology of teachers. The study will examine the attitudes of teachers prior to training, how training affects teacher self-efficacy toward technology and how training affects the attitude of teachers. This study will borrow a term from advising literature coined *intrusive advising*, which describes how college counselors intervene in the lives of students who are likely to drop out of school (Butler, 1999). Instead of college students, this study will deal with teachers and their willingness and confidence to use technology in the classroom. The term used will be *intrusive training* and this study will focus on the effects that intrusive training has on teacher self-efficacy and attitude toward technology.

Literature Review

Teachers' attitudes, concerns and views toward technology

Realizing that technology enhances student achievement and with technology inundating our public school classrooms, many teachers have started using technology more consistently to teach students and augment their lessons, though others have not fully embraced technology (Abbott, 2003 as cited in Zhao & Bryant, 2006; Cuban, 2001; Levin & Wadmany, 2008). While training has been shown to increase the likelihood that teachers will use technology, training alone does not ensure that teachers will be willing to use technology in the classroom (Benson, Farnsworth, Bahr, Lewis & Shaha, 2004; Mayo & Kajs, 2005; Sheumaker, Slate & Onwuegbuzie, 2001; Zhao & Bryant, 2006). Factors such as beliefs, feelings and/or knowledge, whether incorrect or correct, directly affect the impact training will have on teachers (Benson, Farnsworth, Bahr, Lewis & Shaha, 2004; Mayo & Kajs, 2005; Sheumaker, Slate & Onwuegbuzie, 2001; Zhao & Bryant, 2006).

Many of the factors that affect teacher's technology use are attitudes and characteristics that manifest themselves in other ways (Benson, Farnsworth, Bahr, Lewis & Shaha, 2004; Mayo & Kajs, 2005; Sheumaker, Slate & Onwuegbuzie, 2001; Zhao & Bryant, 2006). A couple of these attributes are the willingness of teachers to spend time beyond what is required and their openness to change in general. Often the teacher that is most willing to stay late, is open for any type of change or new idea and is willing to spend time in training will be the one most willing to use technology in the classroom (Vannatta & Fordham, 2004). Russell, O'Dwyer, Bebell, and Tao (2007) surmised that tenure and longevity also play a role in the willingness on a teacher's part to use technology. Their findings suggest the longer a teacher has been teaching, the less they use technology in any capacity. They also propose, generally, that teachers who are new to a

particular school use technology less than teachers who have been at the school between 3 and 10 years. The time a teacher has been at a particular school seems to be a stronger indicator of one's technology use than years the teacher has been teaching (Russell et al., 2007).

In addition to personality traits and length of time in a particular school, teachers may have apprehensions toward new technology that may influence their willingness to participate in training or use technology in the classroom with students (Donavan, Hartley, & Strudler, 2007). A major concern for teachers is how the new technology will impact them personally, and how they can use the new technology to meet the needs of students (Donavan, Hartley, & Strudler, 2007). Teachers are hesitant to change their methods of teaching, especially when they are uncomfortable with their knowledge concerning the new technology and how it may interfere with their current practices (Donavan, Hartley, & Strudler, 2007). Attitude toward technology can be affected by preconceived negative attitudes and misconceptions that teachers bring to the training and that must be overcome (Teo, 2009). Areas like perceived usefulness of the technology, ease of use, subjective norm (i.e. peer pressure) and facilitating conditions are often barriers that must be dealt with before training ever commences (Teo, 2009).

However, while it is true that teachers are hesitant to change their attitude toward traditional pedagogies and incorporate emerging technology, at least one study indicates they will change if proof is given that new technology will be easy to use and useful in their teaching (Kumar, Rose & D'Silva, 2008). Kumar, Rose and D'Silva, (2008) revealed that to make teachers more comfortable with emerging technology, effort must be made to ensure that teachers maintain a positive attitude toward, or a willingness to try, new technology while at the same time perceiving new technology to be both useful and easy to use. As teachers advance in the technological skills, Levin and Wadmnay (2008) revealed teachers often move away from

educational views that focus on conventional teaching methods of “organization and alignment to a certain curriculum” and toward letting students choose their own learning path according to real-life situations. This movement is seen as a positive step in teaching students how to learn on their own and how to develop higher order thinking skills that are needed to be lifelong learners (Levin & Wadmany, 2008). One can surmise that if teachers are shown the positive reasons for using technology in the classroom they will be less hesitant to change their methods and practices to incorporate the new technology (Kumar, Rose & D’Silva, 2008).

Impact of training on teacher use of technology in the classroom

Mayo and Kajs (2005) determined that those who are trained on how to incorporate technology into their lesson plans and classroom instruction use technology more than their counterparts who have not been trained to use technology in the classroom. Principals who supply their teachers with adequate equipment and training to use the technology equipment are more likely to have schools where technology is integrated into the learning environment (Sawyer, 2011). Additionally, not only do trained teachers use technology more, but students of those teachers also show an increase in technology use indicating that teachers are passing what they have learned to their students (Shuemaker, Slate, & Onwuegbuzie, 2001).

There is a positive difference in the use of technology among teachers who participate in some type of training versus those who go through none (Zhao & Bryant, 2006; Benson, et al, 2004, Mayo & Kajs, 2005). However, it has also been shown that without continual reinforcement the skill level and use of technology will not be maintained (Benson, Farnsworth, Bahr, Lewis & Shaha, 2004). Zhao and Bryant (2006) indicate that while initial teacher technology training is beneficial, it alone does not lead to higher levels of technology integration. According to the authors, one-on-one mentoring experiences after initial training are needed to

maximize the benefit of technology training (Zhao & Bryant, 2006). The training also needs to be as hands-on and real world as possible in order to convince teachers to continue to use the technology (Sutton, 2011).

Impact of training on teacher attitude and self-efficacy toward technology

Technology training must have a positive influence on the attitude, or willingness to try, of teachers to have any effect on their use of technology in the classroom (Levin & Wadmany, 2008). Self-efficacy toward technology is a major indicator on whether or not a teacher will choose to use technology in their classroom (Chia-Pin & Chin-Chung, 2009; Kukafka et al, 2003). The lower the self-efficacy the more likely the teacher will not have a positive attitude or a favorable desire to use technology in the classroom (Pan & Franklin, 2011). Studies shows that teachers who feel inadequately prepared on how to use technology in the classroom will likely have feelings of low self-efficacy and vice versa (Moore-Hayes, 2011; Compeau, Higgins, & Huff, 1999). Teachers who are provided training, and then continued support after training, have significantly higher self-efficacy, or confidence, to integrate technology and use technology for learning than those who have not participated in training sessions (Levin & Wadmany, 2008;). When teachers participate in on-going training, they retain a positive sense of self-efficacy over their counterparts who don't receive ongoing training (Mayo & Kajs, 2005). The training teachers receive needs to leave them comfortable with the technology and the most effective way to do that is to have continual support and training available as needed (Yuen Fook, Sidhu, Kamar, & Abdul Aziz, 2011).

While training has a positive influence on a teacher's favorable view of technology and their self-efficacy, there are other factors to consider concerning training and attitude. If the amount of information in the training is overwhelming, trainees may begin to resent the

technology (Barton & Hayden, 2006). As previously noted, the amount of support the teacher receives also will affect their attitude toward the technology (Christensen, 2002; Kadjevich, 2006). In addition, teachers' attitudes and self-efficacy wanes the further removed one is from the initial technology training if no follow-up training is involved (Milman & Molebash, 2008).

Intrusive Technology Training

With busy schedules and the general demands of teaching, it is often difficult for the classroom teacher to find the time or energy to attend after school or planning day training sessions (Abuhmaid, 2011). Many grow discouraged and use technology little or none at all. College advisors have faced a similar dilemma when trying to decrease attrition rates among some of their students. Some students have negative attitudes and low self-efficacy when it comes to their college work (Butler, 1999; Erwin, 1997; Zelazek, 2011). Eastern Michigan University put a plan together that included intrusive advising for students likely to drop out of college (Erwin, 1997). Intrusive advising describes a method that is used to assist in decreasing the attrition numbers of college students by having advisors actively contact students through electronic and other means to remind them of things such as dates, events and opportunities (Butler, 1999; Erwin, 1997; Zelazek, 2011). Intrusive advising has proven to be effective in college student retention (Butler, 1999; Erwin, 1997; Zelazek, 2011).

Just as college students may become overwhelmed with the demands placed on them, teachers often feel overwhelmed or disinterested when presented with new technological opportunities (An & Reigeluth, 2012; Abuhmaid, 2011). With hectic schedules, busy lives and the general demands of being a teacher, it is easy to overlook professional development opportunities or find reasons to cancel a meeting with the Instructional Technology Specialist. Using a personal, intervening method similar to intrusive advising but having it focus on

technology training for teachers, may help increase teachers' attitude and self-efficacy toward technology in the classroom due to the personal one-on-one and continual nature of the training (Zhao & Bryant, 2006). This researcher has coined the phrase "intrusive training" defined as making proactive steps on the part of the Instructional Technology Specialist to introduce teachers to new information, ideas, and instruction through emails, social media, small group trainings, and face-to-face meetings. A trained specialist can 1) guide teachers through a new application, 2) focus on an immediate need or topic for an upcoming lesson and 3) work at the teacher's own pace so they can feel successful from the beginning, all which have been shown to build self-efficacy toward technology in teachers (Ertmer & Ottenbreit-Leftwich, 2010). Teachers can be encouraged, informed and answered without having to register for a class, drive across the county or find a baby sitter. Through face-to-face visits, emails, Tweets and other forms of communication the professional learning comes to them and, with support, improves their self-efficacy and attitude toward technology in the classroom (Chen, 2012). This action research study intends to determine if intrusive training has an effect on teacher attitude and self-efficacy toward technology use in the classroom.

Conclusion

Teachers bring with them a variety of biases or attributes that determine their likelihood of using technology (Donovan, Hartley & Strudler, 2007; Russell, O'Dwyer Bebell, & Tao, 2007; Tao, 2009; Vanetta & Fordham, 2004). However if teachers are shown technology is useful and easy to use, it improves their attitude toward the technology and therefore increases the chances they will use the technology (Kumar, Rose & D'Silva, 2008; Levin & Wadmany, 2008; Teo, 2009; Kukafka et al, 2003). Technology training helps foster positive attitudes toward technology in those who may have concerns and a positive attitude along with ease of use and

usefulness of the technology will help increase the likelihood that technology will be used in the classroom (Levin & Wadmany, 2008; Mayo & Kajs, 2005). Teacher training is vital to a positive attitude as long as it isn't overwhelming and teachers feel supported in the use of technology as they begin implementing it in their classroom (Barton & Hayden, 2006). Of note, is the susceptibility of attitude and confidence to wane the further removed one is from the initial training (Milman & Molebash, 2008). Teacher use of technology in the classroom has been shown to increase with initial training; however, it is important to note that continual reinforcement is needed for the training to be most beneficial (Benson, Farnsworth, Bahr, Lewis & Shaha, 2004; Christensen, 2002; Kadijevich, 2006; Zhao & Bryant, 2006, Yuen Fook, et.al., 2011). And lastly, although teachers often desire to implement technology into their classroom, it is often difficult for teachers to find the time and energy to participate in training (Abuhmaid, 2011). This study seeks to explore a plan that will maximize the use of teachers' time and feelings of support, while minimizing their fears and apprehensions toward technology.

Statement of Purpose

The purpose of this study is to look at the effect that intrusive training has on teacher attitude and self-efficacy toward technology. It is hypothesized that as contact with the Instructional Technology Specialist and in-school training opportunities are increased there will be a rise in teacher self-efficacy toward technology and a more positive attitude, or favorable feeling and willingness toward technology use.

The following research questions guide this study:

1. How are the attitudes of teachers' affected by intrusive training techniques?
2. How is the self-efficacy of teachers' affected by intrusive training techniques?

Method

Subjects

The subjects (N=46) for this study were teachers from two elementary schools located in Effingham County, Georgia. The schools were chosen through a purposive sampling by comparing three factors: average age of teachers, level of certification and number of years teaching. Every teacher at each school was invited to participate through an email from the researcher and although participation was encouraged, it was voluntary. One group served as the treatment group (N=24) and the other served as the control group (N=22).

Design

This was a quasi-experimental study. The choice between which school would be the control group and which would be the treatment group was chosen based on a coin flip. The independent variable in this study was the training mode, either standard or intrusive training, provided by the Instructional Technology specialist and the dependent variables were the self-efficacy and attitudes teachers possess toward technology in their classroom.

Instrumentation

The same pre- and post-experiment survey questions were administered to both the control and treatment groups. The survey questions were borrowed with permission (See Appendix D) from a study by Crittenden (2009) who modified two separate studies, one from Albirini (2006) and one from Wang, Ertmer and Newby (2006) (See Appendix A). The survey consisted of 40 questions broken into two parts with an introduction added by this researcher to determine general demographics of the subjects. A Cronbach's Alpha test was conducted on both the attitude pre and post survey questions as well as the self-efficacy pre and post survey questions. The reliability score for the pre survey attitude questions was .891 and for the post

survey attitude questions it was .941. The reliability score for the pre survey self efficacy questions was .878 and for the post survey self efficacy questions it was .934.

The pre treatment survey was administered in electronic form through SchoolWires, the county web provider, to both groups. The post-experiment survey was administered in electronic form to both groups after the four and half week treatment program was complete. The same survey was used both times and responses were compared. Part 1 of the survey consisted of demographic questions created by the author. The questions from Part 2 of the survey were originally created by Albirini (2006) for his study involving 326 English-as-a-Foreign-Language teachers and determined teachers' attitude toward technology. The questions themselves were evaluated and reviewed by a panel of experts to ensure appropriateness both culturally and technically (Albirini, 2006). Part 2 questions were presented in a Likert-scale survey.

Part 3 was created originally by Wang, Ertmer and Newby (2006) for their study involving twenty pre-service teachers and rated teachers' self-efficacy toward technology and was also part of Crittenden's study (2009). Part 3 questions were created after consulting content area experts according to the original authors (Wang, Ertmer & Newby, 2006). The questions in Part 3 of the survey were presented in a Likert-scale survey form.

Teachers were not asked to include their name in the survey to give more anonymity to the process. Upon retrieving all the surveys, each submission was assigned a code starting with A1-01 or B1-01 where "A" was the control group and "B" was the treatment group. Each teacher was assigned a number starting with 01-99 in their respective groups. This researcher assigned each participant a code which was used throughout the process. The electronic survey results are stored in the files and folders section of the Instructional Technology pages on the District website and are only accessible by password.

Procedures

Current practice for teacher professional development training includes teachers requesting assistance in using technology in their classroom on an as needed basis through submission of a work order. The training session is held at the teacher's convenience usually in their room before or after school or during their planning. Additionally, teachers are offered professional development opportunities through weekly group sessions known as "Tech Thursday's". They may also participate in a county-wide "Effingham Technology Day" as well as opportunities, specific to schools, at the requests of administration or others. For this study, the control group received no intrusive training and were trained and visited by the Instructional Technology Specialist (ITS) using current practice. In addition, there are two Instructional Technology Specialists in the county including this researcher. This researcher concentrated on all requests from the treatment group's school while the other ITS concentrated on the other schools. This researcher was expected from time to time to complete work order requests from other schools but was based out of the treatment group's school when not on assignment. The treatment group received intrusive training from the Instructional Technology Specialist, in various forms, without requesting training. The idea of intrusive training, as explained in the *Intrusive Technology Training* section, was borrowed from the student advising field's *intrusive counseling* and is best described as proactive steps on the part of the Instructional Technology Specialist to introduce teachers to new information, ideas, and instruction through emails, social media, small group trainings, and face-to-face meetings. In this study, it also included the increased availability of the ITS to teachers in the treatment group as this researcher was based out of their school and responded to their work order requests much faster.

The teachers in the two schools were informed of the study one week prior to the date scheduled to begin the treatment program at the treatment school through an email (See Appendix B). Each group was asked to complete an electronic, pre-survey as detailed in the Instrumentation section (See Appendix C). For the duration of the experiment (5 weeks) those in the control group received no additional support or training other than what was requested by individual teachers as described in the Design section. The treatment group was involved in the intrusive portion of action study. The intrusive portion lasted four and a half weeks and included a variety of intrusive opportunities for professional development. The intrusive plan was implemented as follows:

- 1) Three weekly, voluntary, after-school meetings took place at the treatment school each Thursday. Four were scheduled but one was cancelled due to no one registering for the class. It was hosted by the ITS (this researcher) with assistance from a teacher and the other ITS for the county. The meetings covered Twitter, Class Dojo and using tablets in the classroom. The largest meeting (tablets in the classroom) had 7 participants.

- 2) More than 25 tweets were sent during the 4 and a half week period. A variety of topics ranging from “look what we have done in the classroom” to links to websites for specific grade levels and subjects. Only 8 teachers from the treatment school followed the Instructional Technology Specialist so effect was limited. The Instructional Technology Specialist has approximately 100 followers for the entire county.

- 3) At least once each week an email was sent specifically to the treatment school that described a website, tool, tip or reminder.

4) The ITS walked the halls of the schools several times each day he was there and “popped in” on teachers. These conversations lead to many “quick fixes” or appointments to learn more about some aspect of technology.

5) Of the 23 school days of the treatment program, the ITS was at the school 18 of those days. Two days were taken away for Fall Break, leaving on three days that the ITS did not go to the school at least for a partial day. Other duties carried the ITS away on those days.

Data Analysis

Two separate one-way between-groups analyses of covariance was conducted to compare the effectiveness of intrusive training on the attitude and self-efficacy of teachers toward technology.

Testing for assumptions was completed prior to conducting the analysis of covariance to ensure there was no violation of the assumptions of linearity, homogeneity of regression slopes, equality of variance and measurement of covariant. The influence of the covariate (attitude pre survey) can be seen as significant because the value .000 indicates there is a significant relationship between the covariate and the dependent variable while controlling for the independent variable. In addition, with a Sig. value of .445 in the Levene’s Test of Equality of Error Variance in the attitude portion and a Sig value of .884 in the self-efficacy portion there is no violation of equality of variance. A value of less than .05 would have indicated the variances were not equal and therefore would have violated the assumption.

The first analysis was conducted to determine the effectiveness of intrusive training on teachers’ attitude toward technology. The independent variable was the group (Control, Treatment) and the dependent variable was the sum of the first 20 questions of the post survey which related to attitude, given to each group after the end of the 5-week treatment period. The

covariate in the study was the sum of the first 20 questions of the pre-survey which related to attitude, given to each group prior to any treatment being administered.

The main ANCOVA results in Table 1 labeled “Test of Between-Subjects Effects” indicate that the results of the pre and post surveys are NOT significantly different. The results show a Sig value of .444 which is greater than .05 (the alternative alpha level). For there to be significant difference, the value would need to be lower than .05. The adjusted means for teacher attitude is shown in Table 2. With the means adjusted for the covariate (pre survey scores) the value for the control group is 86.664 and for the treatment is 87.767.

Table 1

Analysis of Covariance for Effect of Intrusive Training on Teacher Attitude Toward Technology

Source	SS	df	MS	F	P
Pre Attitude Sum	1810.090	1	1810.090	78.302	.000
Group	13.819	1	13.819	.598	.444
Error	994.016	43	23.117		
Total	352895.000	46			

a. R Squared = .646 (Adjusted R Squared = .629)

Table 2

Adjusted Means for Effect of Intrusive Training on Teacher Attitude Toward Technology

Group	Adjusted Mean	Std Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Control	86.664	1.028	84.951	88.736
Treatment	87.767	.984	85.783	89.750

The second analysis was conducted to determine the effectiveness of intrusive training on teachers' feelings of self-efficacy toward technology. The independent variable was the group (Control, Treatment) and the dependent variable was the sum of the last 20 questions of the post survey which related to self-efficacy, given to each group after the end of the 5-week treatment

period. The covariate in the study was the sum of the last 20 questions of the pre-survey which related to self-efficacy, given to each group prior to any treatment being administered.

The main ANCOVA results in Table 3 labeled “Test of Between-Subjects Effects” indicate that the results of the pre and post surveys are NOT significantly different. The results show a Sig value of .240 which is greater than .05 (the alternative alpha level). For there to be significant difference, the value would need to be lower than .05. The adjusted means for teacher self efficacy are shown in Table 4. With the means adjusted for the covariate (pre survey scores) the value for the control group is 79.887 and for the treatment is 82.312.

Table 3
Analysis of Covariance for Effect of Intrusive Training on Teacher Self-Efficacy Toward Technology

Source	SS	Df	MS	F	P
Pre Self-Efficacy	3051.513	1	3051.513	67.697	.000
Sum					
Group	63.877	1	63.877	1.417	.240
Error	994.016	43	23.117		
Total	307955.000	46			

a. R Squared = .613 (Adjusted R Squared = .595)

Table 4
Adjusted Means for Effect of Intrusive Training on Teacher Self Efficacy Toward Technology

Group	Adjusted Mean	Std Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Control	79.887	1.452	76.958	82.816
Treatment	82.312	1.389	79.511	85.113

Discussion

Summary

This study centered on the hypothesis that as contact with the Instructional Technology Specialist increased and more opportunities afforded themselves to teachers through intrusive training there would be a favorable increase in teachers' attitude and self-efficacy toward technology. Intrusive technology was defined as making proactive steps on the part of the Instructional Technology Specialist to introduce teachers to new information, ideas, and instruction through emails, social media, small group trainings, and face-to-face meetings. Pre survey questions gauging teacher attitude and self efficacy toward technology were deployed to a control group and a treatment group. A four and a half week program was implemented with teachers at the treatment school where the Instructional Technology Specialist completed walk through, face-to-face meetings, sent emails and tweets, contacted teachers individually and was generally available for the teachers as much as possible. After the four and half week program, the same questions were submitted to teachers in a post survey. The results were reported and analyzed using the SPSS program.

The findings indicate that although the means adjusted for the covariate were higher in the treatment group, the difference was not great enough to reach statistical significance. The hypothesis that there would be a favorable increase in teacher's attitude and self-efficacy after intrusive training could not be supported through the findings of this study. The two research questions proposed at the beginning of this study were: How are the attitudes of teachers' affected by intrusive training techniques? How is the self-efficacy of teachers' affected by intrusive training techniques? With no significant difference reported in this study, the answer to

these questions are that intrusive training techniques effect on teachers' attitude or self-efficacy toward technology were not proven by this study.

Limitations

While no significant difference was found there are many limitations to this study that must be taken into account. A major limitation was the length of time the treatment group had with the ITS conducting intrusive training. With only four and a half weeks of intrusive training it is more difficult to notice changes in attitudes and self-efficacy. With each week there was an increase in questions, emails, etc that led the researcher to believe that teachers were becoming increasingly comfortable approaching the ITS. If the treatment time had been longer it is felt that this increase in activity would have likely continued thereby possibly affecting the results. In addition, because the two schools were chosen using purposive sampling by the researcher and participants were not randomly from all over the county there may be some skewing of the data. This created a smaller pool from which participants were pulled. In an effort to lessen the effect of this limitation, three factors were compared and the schools with teachers that were closest in comparison were used. The 3 factors were: years of service, level of certification, and age of teacher.

A limitation of this study is also the small sample size. The sample size of the control group was 22 teachers and 24 for treatment group. The number of participants was actually higher but 8 surveys had to be removed because teachers only completed part of the questions. With a small group it was harder to generalize or deduce inferences that apply to a larger population.

Another limitation included the inability (and the lack of desire) to keep teachers from sharing what they learned with colleagues from the neighboring school serving as the control

group. Completing this study in a small county between two schools that are geographically and socially neighbors increased the chances that information given to the treatment group will make its way to the control group. Under normal circumstances this is encouraged, but in this study it may have skewed the data because the control group received some information that only the treatment group was supposed to receive. For this reason, however, two schools were chosen and separated as control group and treatment group. If teachers were chosen randomly, within the county, there would be an increased chance that two teachers who teach next door to each other would be in opposite groups and could more easily share, thereby skewing the data even more.

Lastly, as part of the treatment, the researcher sent out Tweets and emails to teachers with ideas and information. However, it is not known how many participants actually read the Tweets or emails that were sent and received the information. It is known that some teachers did because they replied to the emails, however there was no process in place to actually validate that teachers read the tweets and emails that were sent.

Conclusion

Existing literature indicates the more support there is for teachers concerning technology the more favorable the attitude and self efficacy they will exhibit (Zhao & Bryant, 2006; Benson, et al, 2004, Mayo & Kajs, 2005, Kumar, Rose & D'Silva, 2008; Levin, 2008; Teo, 2009; Kukafka et al, 2003). While the results of this study did not support the hypothesis that intrusive training effects teachers attitude and self efficacy toward technology, there were several limitations that may have affected the findings. This researcher did experience positive interactions with the participants of the treatment school that led him to believe that given more time results would have shown a positive effect on teacher attitude and self-efficacy. Much of the positive interaction with teachers took place because of the location of the temporary office of

the researcher. The school principal placed the researcher in the copyroom which also doubled as a shortcut to the office area. This allowed the researcher and the teachers to communicate and interact easily. Often conversations were started in the copy room and ended with the researcher in the classroom of the teacher explaining or training the teacher on a new concept or idea. Strength of relationships, teacher comfort level and knowing that help was close, led the researcher to believe that positive change was being made although it did not appear in the results.

Implications

While the results seem to indicate the need for intrusive training is minimal, this researcher believes that a precedent has been set with this study. It is the desire of this researcher that this study will spur other studies in the county to evaluate the need for more instructional technology assistance for teachers. More research with longer treatment times is needed to test this hypothesis. This author suggests a long term study with a single Instructional Tech Specialist at a school over an extended period of time would yield a significant difference in the results and support the hypothesis of this study. As it stands, this study did not yield results that could be used to support the hypothesis.

References

- Abuhmaid, A. (2011). ICT training courses for teacher professional development in Jordan. *Turkish Online Journal of Educational Technology – TOJET*, 10(4), 195-210.
- Akengin, H. (2008). Opinions of prospective social studies teachers on the use of information technologies in teaching geographical subjects. *Journal of Instructional Psychology*, 35(2), 126-139.
- Albirini, A. (2006). Teacher's attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education*, 47(4), 373-398.
- An, Y., & Reigeluth, C. (2012). Creating technology-enhanced, learner-centered classrooms: K-12 teachers' beliefs, perceptions, barriers, and support needs. *Journal of Digital Learning in Teacher Education*, 28(2), 54-62.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman and Company.
- Barton, R., & Haydn, T. (2006). Trainee teachers' views on what helps them to use information and communication technology effectively in their subject teaching. *Journal of Computer Assisted Learning*, 22(4), 257-272.
- Benson, L., Farnsworth, B., Bahr, D., Lewis, V., Shaha, S. (2004). The impact of training in technology assisted instruction on skills and attitudes of pre-service teachers. *Education*, 124(4), 649-663.
- Butler, W. L. (1999). Intrusive advisement, counseling, and tutoring: an interactive model for retaining academically under-prepared students. *Negro Educational Review*, 50(3-4), 109-122.
- Chen, L. (2012). Improving teachers' teaching with communication technology. *Journal of Educational Technology Systems*, 40(1), 35-43.

- Chia-Pin, K., & Chin-Chung, T. (2009). Teachers' attitudes toward web-based professional development, with relation to Internet self-efficacy and beliefs about web-based learning. *Computers & Education*, 5366-73. Doi:10.1016/j.compedu.2008.12.019
- Christensen, R. (2002). Effects of technology integration education on the attitudes of teachers and students. *Journal of Research and Technology in Education*, 34(4), 411.
- Crittenden, J. C. (2009). Factors influencing the attitudes and self-efficacy of Mississippi allied health educators toward information and communication technology. *Career & Technical Education Research*, 34(3), 155-174.
- Compeau, D., Higgins, C. A., & Huff, S. (1999). Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly*, 23(2), 145-158.
- Cuban, L. (2001). *Oversold & underused: Computers in the classroom*. Cambridge, MA: Harvard University Press.
- Delen, E., & Bulut, O. (2011). The relationship between students' exposure to technology and their achievement in science and math. *Turkish Online Journal of Educational Technology – TOJET*, 10(3), 311-317.
- Donovan, L., Hartley, K., & Strudler, N. (2007). Teacher concerns during initial implementation of a one-to-one laptop initiative at the middle school level. *Journal of Research on Technology in Education*, 39(3), 263-286.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology In Education*, 42(3), 255-284.
- Erwin, J. (1997). An intrusive, comprehensive advising and career planning system: Eastern Michigan University. *New Directions for Institutional Research*, 1997(94), 89.

- Kadijevich, D. (2006). Achieving educational technology standards: The relationship between student teacher's interest and institutional support offered. *Journal of Computer Assisted Learning*, 22(6), 437-443.
- Kumar, N., Rose, R., and D'Silva, J. (2008). Teachers' readiness to use technology in the classroom: An empirical study. *European Journal of Scientific Research*, 21(4), 603-616.
- Kukafka, R., Johnson, S.B., Linfante, A. & Allegrante, J.P. (2003). Grounding a new information technology implementation framework in behavioral science: A systematic analysis of the literature on IT use. *Journal of Biomedical Informatic*, 36(3), 218-227
- Levin, T., & Wadmany, R. (2008). Teachers' views on factors affecting effective integration of information technology in the classroom: Developmental scenery. *Journal of Technology and Teacher Education*, 16(2), 233-263.
- Martin, W., Strother, S., Beglau, M., Bates, L., Reitzes, T., & Culp, K. (2010). Connecting instructional technology professional development to teacher and student outcomes. *Journal of Research on Technology in Education*, 43(1), 53-74.
- Martin, K., & Kudláček, M. (2010). Attitudes of pre-service teachers in an Australian university towards inclusion of students with physical disabilities in general physical education programs. *European Journal of Adapted Physical Activity*, 3(1), 30-48.
- Mayo, N., Kajs, L., & Tanguma, J. (2005). Longitudinal study of technology training to prepare future teachers. *Educational Research Quarterly*, 29(1), 3-15.
- Milman, N., & Molebash, P. (2008). A longitudinal assessment of teacher education student's confidence toward using technology. *Journal of Educational Computing Research*, 38(2), 183-200. Retrieved from ERIC Document Reproduction Service No. EJ789468

- Moore-Hayes, C. (2011). Technology integration preparedness and its influence on teacher-
efficacy. *Canadian Journal of Learning And Technology*, 37(3),
- Pan, S., & Franklin, T. (2011). In-service teachers' self-efficacy, professional development, and
web 2.0 tools for integration. *New Horizons in Education*, 59(3), 28-40.
- Russell, M., O'Dwyer, L., Bebell, D., & Tao, W. (2007). How teachers' uses of technology vary
by tenure and longevity. *Journal of Educational Computing Research*, 37(4), 393-417.
- Sawyer, T. (2011). Technology integration in Georgia public elementary schools. *EagleScholar*,
Retrieved from *EBSCOhost* (accessed February 4, 2013)
- Sheumaker, F., Slate, J., & Onwuegbuzie, A. (2001). The role of InTech training in the
integration of technology into instructional practices among Georgia middle school
teachers. *Journal of Research on Computing In Education*, 33(5), 1-12.
- Snyder, T. D., Dillow, S. A., & National Center for Education Statistics (2011). *Digest of
Education Statistics*, 2010. NCES 2011-015. National Center for Education Statistics
- Sutton, S. R. (2011). The pre-service technology training experiences of novice teachers. *Journal
of Digital Learning in Teacher Education*, 28(1), 39-47
- Teo, T. (2009). The impact of subjective norm and facilitating conditions on pre-service
teachers' attitude toward computer use: A structural equation modeling of an extended
technology acceptance model. *Journal of Educational Computing Research*, 2009, Vol.
40 Issue 1, p89-109, 21p, DOI: 10.2190/EC.40.1.d
- Vannatta, R., & Fordham, N. (2004). Teacher dispositions as predictors of classroom technology
use. *Journal of Research on Technology in Education*, 36(3), 253-271.

- Wang, L., Ertmer, P. A., & Newby, T. J. (2004). Increasing preservice teachers' self-efficacy beliefs for technology integration. *Journal of Research on Technology in Education, 36*, 231-250.
- Yuen Fook, C., Sidhu, G., Kamar, N., & Abdul Aziz, N. (2011). Pre-service teachers' training in information communication and technology for the ESL classrooms in Malaysia. *Turkish Online Journal of Distance Education, 11*(3), 97-108.
- Zelazek, J. R. (2011). Intrusive advisement: A necessary process to retain graduate student and bolster graduation rates. *Online Submission*.
- Zhao, Y., & Bryant, F. (2006). Can teacher technology integration training alone lead to high levels of technology integration? A qualitative look at teacher's technology integration after state mandated technology training. *Electronic Journal for the Integration of Technology in Education, (5)*, 53-62.

Appendix A

Pre/Post Survey

Part 1 – Demographics

1. What school do you teach at?
 - a. MES
 - b. SEES
2. What is your highest level of education?
 - a. Bachelor
 - b. Master
 - c. Educational Specialist
 - d. Doctorate
3. What is your age?
 - a. 21-34
 - b. 35-44
 - c. 45-54
 - d. Above 55
4. How many years have you been teaching?
 - a. 1-5
 - b. 6-10
 - c. 11-15
 - d. 16-20
 - e. Over 20

Part 2 – Attitude Toward Technology**1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree****Teacher attitude toward technology**

1. Computers do not scare me at all.
2. Computers make me feel uncomfortable.
3. I am glad there are more computers these days.
4. I do not like talking with others about computers.
5. Using computers is enjoyable.
6. I dislike using computers in teaching.
7. Computers save time and effort.
8. Schools would be a better place without computers.
9. Students must use computers in all subject matters.
10. Learning about computers is a waste of time.
11. Computers would motivate students to study more.
12. Computers are a fast and efficient means of getting.
13. I do not think I would ever need a computer in my classroom.
14. Computers can enhance students' learning.
15. Computers do more harm than good.
16. I would rather do things by hand than with a computer.
17. If I had the money, I would buy a computer.
18. I would avoid computers as much as possible.
19. I would like to learn more about computers.
20. I have no intention to use computers in the near future.

Part 3 – Technology Self-Efficacy**1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree****Teacher self-efficacy toward technology**

21. I feel confident that I understand computer capabilities well enough to maximize them in my classroom.
22. I feel confident that I have the skills necessary to use the computer for instruction.
23. I feel confident that I can successfully teach relevant subject content with appropriate use of technology.
24. I feel confident in my ability to evaluate software for teaching and learning.
25. I feel confident that I can use correct computer terminology when directing students' computer use.
26. I feel confident I can help students when they have difficulty with the computer.
27. I feel confident I can effectively monitor students' computer use for project development in my classroom.
28. I feel confident that I can motivate my students to participate in technology-based projects.
29. I feel confident I can mentor students in appropriate uses of technology.
30. I feel confident I can consistently use educational technology in effective ways.
31. I feel confident I can provide individual feedback to students during technology use.
32. I feel confident I can regularly incorporate technology into my lessons, when appropriate to student learning.
33. I feel confident about selecting appropriate technology for instruction based on curriculum standards.
34. I feel confident about assigning and grading technology-based projects.

35. I feel confident about keeping curricular goals and technology uses in mind when selecting an ideal way to assess student learning.
36. I feel confident about using technology resources (such as spreadsheets, etc.) to collect and analyze data from student tests and products to improve instructional practices.
37. I feel confident that I will be comfortable using technology in my teaching.
38. I feel confident I can be responsive to students' needs during computer use.
39. I feel confident, as time goes by, my ability to address my students' technology needs will continue to develop.
40. I feel confident that I can develop creative ways to cope with system constraints (such as budget cuts on technology facilities) and continue to teach effectively with technology.
41. I feel confident that I can carry out technology-based projects even when I am opposed by skeptical colleagues.

Appendix B

Informed Consent Form



Georgia Southern University

Department of Leadership, Technology, and Human Development

Dear Participant,

I am Gregg Miles, Instructional Technology Specialist for Effingham County. I am working on my Educational Specialist Degree from Georgia Southern University. I am interested in evaluating the effect that “intrusive” training has on the self-efficacy and attitudes of teachers toward technology. “Intrusive training” simply means the training comes to you instead of having to seek out training. This study will benefit the Effingham County School District by studying the effects that consistent and readily available support to teachers has on self-efficacy and attitude toward the use of technology in the classroom.

Your school has been chosen to participate in the study. To briefly explain the study, I will select two schools to participate. The teachers at one school will be randomly chosen to be the control group and the teachers at the other school will be randomly chosen to be the treatment group. Both groups will be asked to fill out a pre- and post-treatment survey on the district website. All responses will remain anonymous and your participation will be encouraged but not mandatory. The survey should take no more than 20 minutes. The control group will receive assistance as requested by Sysaid’s, in other words, “business as usual”. The treatment

group will receive electronic and personal communication 3-5 times a week through emails, Tweets, face-to-face contacts and other ways as determined by the researcher. The details will be explained in full at a pre-arranged faculty meeting during the first week of school.

If you have any questions do not hesitate to contact me.

Thank you,

Gregg Miles

gmiles@effingham.k12.ga.us

Title of Project: How is teacher self-efficacy and attitude toward technology affected by extended intrusive training?

Principal Investigator: Gregg Miles, 30 Aspen Lane, Ellabell, GA 31308, 912.655.7340

gmiles@effingham.k12.ga.us

Faculty Advisor: Charles Hodges, chodges@georgiasouthern.edu

Participant Signature

Date

I, the undersigned, verify that the above informed consent procedure has been followed.

Investigator Signature

Date

Appendix C

Georgia Southern University

Department of Leadership, Technology, and Human Development

Teachers,

I am Gregg Miles, Instructional Technology Specialist for Effingham County. I am working on my Educational Specialist Degree from Georgia Southern University. I am interested in evaluating the effect that “intrusive” training has on the self-efficacy and attitudes of teachers toward technology. “Intrusive training” simply means the training comes to you instead of having to seek out training. This study will benefit the Effingham County School District by studying the effects that consistent and readily available support to teachers has on self-efficacy and attitude toward the use of technology in the classroom.

Your school has been chosen to participate in the study. Below is a link to the pre-experiment survey I need you complete. While participation is anonymous and voluntary I do ask that each of you consider participating. The survey is 41 statements that you rate on a Likert-scale (1 Strongly Disagree - 5 Strongly Agree) and should not take you more than 10 minutes to complete.

To help me collect data, I am asking that you please complete the survey linked below.

<http://www.effinghamschools.com//cms/module/selectsurvey/TakeSurvey.aspx?SurveyID=529>

Thank you in advance,

Gregg Miles

Instructional Technology Specialist

Appendix D

Letter from Dr. Crittenden - Permission to use survey

Hi Greg,
Yes, you can absolutely use my instrument for your work.

Good luck with your project!

Jason

Jason Crittenden, PhD

Program Director, Information Technology
South University | Richmond Campus

On Wed, Feb 6, 2013 at 11:59 AM, Miles, Gregg <gmiles@effingham.k12.ga.us> wrote:
Dr. Crittenden,

My name is Gregg Miles and I'm pursuing my Education Specialist degree from Georgia Southern University. Per our phone conversation, I would like to use the survey that you created for your research study on "Factors Influencing the Attitudes and Self-Efficacy of Mississippi Allied Health Educators Toward Information and Communication Technology". If you would allow this please reply to this email in the affirmative so that I may have a "hard copy for my records.

Thank you,
Gregg Miles
Instructional Technology Specialist
Effingham County

Appendix E

Letter from Dr. Ertmer - Permission to use survey

Dr. Ertmer,

My name is Gregg Miles and I'm pursuing my Education Specialist Degree from Georgia Southern University in Statesboro, GA. This is my first attempt at doing something like this so I want to make sure I do everything right. I found a self-efficacy survey that you created for your paper "Impact of Vicarious Learning Experiences and Goal Setting on Preservice Teachers' Self-Efficacy for Technology Integration: A Pilot Study".

My action study will be a little different but I would like to ask permission to use the 21 questions that you asked in your study.

Please let me know if you are willing for me to use your survey questions.

If you have any questions feel free to contact me

Thank you for your time,

Gregg Miles
1234miles@gmail.com

Yes of course, Gregg, that would be fine as long as you give credit.

I believe that survey was published in: Wang, L., Ertmer, P. A., & Newby, T. J. (2004). Increasing preservice teachers' self-efficacy beliefs for technology integration. *Journal of Research on Technology in Education*, 36, 231-250.

Thanks,
Peg

Peggy A. Ertmer
Professor of Learning Design and Technology
Founding Editor, Interdisciplinary Journal of Problem-based Learning (IJPBL)
Purdue University, College of Education
Room 3144
100 N. University Street
West Lafayette, IN 47907-2098
pertmer@purdue.edu; 765-494-5675
<http://www.edci.purdue.edu/ertmer>

From: Gregg Miles <1234miles@gmail.com>
Date: Tuesday, February 26, 2013 3:24 PM
To: Peg Ertmer <pertmer@purdue.edu>
Subject: Permission to use Survey



Gregg Miles <1234miles@gmail.com>
to Peggy

Thank you so much.

Gregg Miles

Sent from my iPhone

Appendix F



Georgia Southern University

Department of Leadership, Technology, and Human Development

4.20.2013

Human Subjects - Institutional Review Board
Georgia Southern University
P.O. Box 8005
Statesboro, GA 30461

To Whom It May Concern:

Gregg Miles has requested permission to collect research data from South Effingham Elementary and Marlow Elementary in the Effingham County School District through a project entitled "How does intrusive training effect teacher attitude and self-efficacy?". I have been informed of the purposes of the study and the nature of the research procedures. I have also been given an opportunity to ask questions of the researcher.

As a representative of Effingham County School District, I am authorized to grant permission to have the researcher recruit research participants from our school district. Gregg Miles is also permitted to collect research data from the participating schools.

If you have any questions, please contact me at 912.754.6491

Sincerely,

Greg Arnsdorff
Assistant Superintendent
Effingham County School District