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From Chalk Boards to Smart Boards: Technology in the Classroom

Megan E. O'Malley
Regis University

Regis University
School for Professional Studies Graduate Programs
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FROM CHALK BOARDS TO SMART BOARDS:

TECHNOLOGY IN THE CLASSROOM

by

Megan E. O'Malley

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ABSTRACT

From Chalk Boards to SMART Boards: Technology in the Classroom

Researchers support the use of technology in the classroom as a way to enhance the learning environment and student achievement. Successful technological integration depends on appropriate teacher training. There are numerous ways to successfully integrate technology into the classroom such as educational technology, business partnerships, and technological tools. Teachers have the ability to introduce students to varying types of technology at an early age, better preparing students for their educational career. Educating administrators and teachers alike is the first step in creating successful classrooms. This first purpose of this project was to explore the effects that technology use had on student achievement. The second was to create an inservice including the information to educate teachers and administrators about the benefits of technology use.

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Chapter 1

INTRODUCTION

Students depend on teachers to instruct them and expose them to the most current, up to date, and effective types of information. Through the guidance of technologically confident and prepared teachers, students can achieve higher levels of thinking and more enhanced learning experiences. Through the use of personal computers, the Internet, SMART boards, community learning, business pairing, among other methods, students' learning experiences will be more comprehensive and meaningful.

Statement of the Problem

In this age when technology knowledge is a must for success, teachers are under scrutiny for their lack of technological integration in the classroom at the primary level. Lack of confidence, training, budget, and resources prevent many teachers from the integration of technology into their classrooms. District officials, as well as teachers, must find ways to facilitate technology integration at the primary level to ensure student success and performance in their formative years.

Purpose of the Project

The purpose of this project will be to present educators and school officials with information in regard to ways to integrate technology in the classroom. This author will inform school officials of the reasons why it is beneficial to integrate technology in the

classroom, the reasons why most teachers do not integrate technology in the classroom, and then offer them ways to alleviate these barriers. Also, this author will model various types of technology that can be integrated into the classrooms to increase teacher confidence and awareness. This information will be delivered to educators in the form of an inservice with an additional brochure.

Definition of Terms

The following list of words and phrases are terms that will be used throughout the proposal, and in Chapter 2 in particular:

ACT Office of Policy Research: Organization dedicated to informing policy makers and the general public on important issues in education by providing timely information that can directly enhance knowledge, dialogue, and decision making (Noeth & Volkov, 2003).

eMints: Enhancing Missouri Instructional Networked Teaching Strategies. This program was initially designed to boost student achievement throughout the urban district of Missouri (eMINTS, 2006).

Internet: The vast collection of interconnected networks that are connected by the TCP/IP protocols and that evolved from the ARPANet of the late 1960s and early 1970s (Ezner's Glossary of Internet Terms, 2003).

FRLP: Free or Reduced Lunch Program. Federally assisted meal program that provides low cost or free nutritious lunches to students (USDA Food and Nutrition Services, 2006).

Milken Family Foundation: "Serves American public education as an honest broker of research, analyses and new insights into the effective use of technology in teaching and learning (Moursund & Bielefeldt, 1999)

SIIA: Software & Information Industry Association. The members research the effect of integrating technology into schools (SIIA, 2006).

Student to Computer Ratio: Calculated by the division of total school computers by student population (Peck, Cuban, & Kirkpatrick, 2002).

Chapter Summary

By training teachers to integrate technology in the classroom, it is the position of this researcher that students will be more productive members of their learning environment, as well as society. Teachers need adequate exposure to and training in technology in order to be the most effective facilitators of information in their classrooms. In the opinion of this researcher, the use of technology can broaden and enhance student understanding. The goal of this researcher is to deliver information to teachers and officials to make them the most effective and current facilitators they can be.

In Chapter 2, the Review of Literature, this researcher will present the current debates that surround the benefits of technology integration in the classroom. This researcher will make a case for the integration of various types of technology into the classroom as a means to higher level teaching and learning. In Chapter 3, Methods, the researcher will explain how she will deliver her findings to teachers and district officials. This proposal will include the plans for the presentation that will teach the audience why

teachers are hesitant to use technology in their classrooms, why they should integrate technology into their classrooms, and most importantly, what types of technology the teacher can integrate into the classroom setting.

Chapter 2

REVIEW OF LITERATURE

The purpose of this project will be to inform educators, school officials, and parents with information about ways to integrate technology into the classroom. Many teachers, parents, school officials, and students disagree about how much technology should be integrated into the classroom. Over the past couple of decades, technology use in the classroom has increased substantially. However, the extent to which the presence of the technology has increased test scores or overall student achievement is debatable. Access to computers and the Internet has skyrocketed in most schools, and according to a policy report issued by ACT (2003, as cited in Noeth & Volkov, 2003), school Internet connectivity has grown from 35% in 1994 to 99% in 2001. While most people in the realm of education defend the use of technology to expand student learning in the classroom, others maintain that technology should be used only as secondary material, because it is not known whether its use increases test scores or improves student achievement. In order to prepare students for a technologically savvy society, teachers and school officials must decide whether to increase technology use in the classroom, or abandon it to historically proven practice.

Increase of Technology Use

The use of technology use in schools is on the increase. According to a report from the Software & Information Industry Association (SIIA; 2000), in K-12 schools in

the U.S., spending has almost tripled for instructional technology in the past decade. In the 1991-1992 school year, school administrators spent approximately $2.1 billion on technology in comparison to over $6.2 billion in the 1999-2000 school year, and that amount has since grown.

According to Peck, Cuban, and Kirkpatrick (2000), increased student access to technology and the Internet has become a national priority since 1990. The focus of educators has been to decrease the student to computer ratio. The national student to computer ratio has decreased from 92 students per computer in 1983 to 27 students per computer in 1989. In 1999, there were only 6 students per computer, and that number was projected to rapidly decline as the cost of technology became more affordable to districts. In 1994, only 35% of schools were connected to the Internet, and by 1999, that number increased to over 90% of schools nation wide. According to Peck et al., " the figures today are certainly even higher. This increase in high-tech access represents a staggering national financial investment in school technology over the last 15 years" (p. 2).

eMINTS and Increased Student Achievement

According to staff of the Enhancing Missouri Instructional Networked Teaching Strategies (eMINTS, 2005), technology in the classroom positively affects student achievement. The eMINTS program has been implemented in schools in Missouri, Utah, Maine, Nevada, and Illinois and includes over 22,500 students in Grades 3-8. The goal of eMINTS is to, "transform education for all learners through high-quality teaching powered by technology" (p. 1).

Each eMINTS classroom is equipped with a: (a) teacher laptop and workstation; (b) SMART Board and projector; (c) one computer for every two students in Grades 3-6; (d) one to one laptops in middle and high school; and (e) Microsoft Office, a Concept mapping tool, and a Multimedia editing tool. The purpose of eMINTS is to establish a learning environment that is rich with different levels and types of technology to advance student knowledge and achievement. The teachers are trained appropriately for their acquired technology, and the results from their study indicated that use of this technology has improved student achievement.

Over a period of 4 years, the researchers involved with eMINTS (2005) found that there were statistically significant differences for students in Grades three and four in eMINTS classrooms in comparison to students who were not enrolled in eMINTS classrooms on the statewide Missouri assessments of reading and mathematics. Additionally, test results show that students enrolled in eMINTS classrooms scored higher than students not enrolled in eMINTS classrooms on most state tests. The researchers found, generally, that low income and special education students scored higher on state tests when enrolled in a technologically upgraded classroom than their peers in non eMINTS schools. Enrollment in an eMINTS classroom reduced the deficit for low income students by about 45% and reduced the overall difference for special education students by 53%. In schools where this program was used to increase technological integration in the classroom, the playing field was leveled for low income students, who may not have access to computers at home, and also for the special education students that may not receive adequate training in these technologies.

In a review of the study conducted by eMINTS researchers (2005), Reese (2005) concurred that the high level of technology use in eMINTS classrooms had a positive effect on student achievement. Reese reported that the eMINTS teachers were well prepared to develop a high achieving classroom with high expectations. Reese concluded that "students in eMINTS classrooms are actively engaged through project-based activities using higher-order thinking and questioning skills" (p. 2). In addition, Reese observed that the role of the teacher changed from a traditional role to a more constructivist role when they incorporated technology in the classroom. Reese reported that: (a) teachers' and students' technology skill improved dramatically, (b) student attendance increased, (c) behavioral referrals decreased, and (d) parental involvement increased when technology was used.

In an eMINTS (2005) classroom, various types and levels of technology are incorporated. The eMINTS staff demonstrated that by the integration of technology, student achievement improved drastically through higher state assessment scores as well as improved behavior and attendance. Also, with this integration of technology into the classroom, each student had an equitable opportunity for growth despite ability or socioeconomic background.

Effectiveness of Technology in Schools

According to Noeth and Volkov (2004), researchers for ACT, teachers should use technology to improve learning in schools. Noeth and Volkov believed that the use of technology promised educational opportunities that would help level the playing field in

K-12 education, particularly across gender, racial, and geographic divides.

Bajcsy (2002, as cited in Noeth & Volkov, 2004) maintained that the use of technology could serve as an enabler in learning to:

1. Help organize and provide structure for material to students;
2. Help students, teacher, and parents interact, anytime and anywhere;
3. Facilitate and assist in the authentication and prioritization of Internet material;
4. Simulate, visualize, and interact with scientific structures, procedures, and models;
5. Help in learning history and depicting future trends;
6. Serve as an extension and enhancer for handicapped populations; and
7. Provide automated translators for multilingual populations. (p. 3)

According to Bajcsy, the presence of technology in the classroom would serve a variety of needs, but most importantly, increase students' awareness and ability to succeed.

In addition, Noeth and Volkov (2004) reported that the use of technology will enhance the overall classroom environment as well as student achievement. Noeth and Volkov found that, when technology was combined with traditional instruction, student learning increased in the basic skills area. Also, the researchers found that the integration of computers with traditional instruction resulted in higher student achievement in a variety of subject areas than does stand alone instruction. Further, students learned faster and with greater retention when they used computers than when they learned without computers. Finally, the researchers demonstrated that low achieving and at risk students benefitted the most from use of computers in the classroom.

Sivin-Kachala and Bialo (2000) assessed the use of educational technology from the late 1980s through 2000 and concluded that students benefit from technological integration. They reported that students had a learning advantage when they developed

multimedia presentations on social studies topics, and that kindergarten students who used technology benefitted in: (a) conceptual knowledge, (b) reading comprehension, (c) reading vocabulary, and (d) creativity. In addition, the researchers found significant evidence that the use of educational technology improves attitude and achievement for the special needs population. Also, they reported that the use of technology to connect classrooms in different geographic locations improved student knowledge and academic skills. Finally, they reported that students who worked with technology in the classroom had higher self-esteem and better attitudes toward learning, especially in the low ability and female student categories.

Researchers at the Software Information Industry Association (SIIA; 2000) concurred with prior evidence that the use of technology positively impacts student achievement. The researchers found that teachers, who implemented educational technology correctly, could positively affect student attitudes toward learning and increase student self-concept. They reported that students who used technology in the classroom felt: (a) more successful, (b) were more motivated to learn, and (c) had increased self-esteem and self-confidence. These effects were strongest in: (a) language arts and writing instruction, (b) mathematics instruction, (c) science instruction, (d) telecommunication technology, and (e) video technology. The researchers at SIIA noted that their most substantial finding was in the area of technology and special needs populations.

Technology as an Unknown to Academic Improvement

While many support educational technological integration in the classroom, there are viable concerns in regard to measurement of the actual gains or losses that it can cause in the classroom. Also, researchers (Noeth & Volkov, 2003) have questioned the ineffectiveness of technology in the classroom in regard to: (a) student and teacher confidence, (b) student productivity, and (c) increased test scores. Noeth and Volkov (2003) stated that "It is a daunting task to separate the effects of technology from the effects of other factors that influence teaching and learning" (p. 3).

Noeth and Volkov (2003) warned that, if technology was not implemented properly, its use might actually hinder student performance. In their report, they stated that "providing equal access to technology may not signify equal educational opportunity nor reduce the achievement gap for disadvantaged students. Children with disabilities, or who are minority, poor, or low achievers, may be left behind after the introduction of computers into schools" (p. 11).

In an article published in *Education Week* (2006), the authors observed that the impact of technology on a student is difficult to quantify, such as: (a) higher order thinking, (b) creativity, and (c) research skills. The authors agreed with prior statements from Ringstaff and Kelly (2002, as cited in *Education Week)* that there is no "magic formula that educators and policymakers can use to determine if this 'return' is actually worth the 'investment'" (p.1). The researchers found that it was difficult to claim that the use of technology positively affects student achievement because the measuremrnt of gains was simply too vague.

Also, the researchers from *Education Week* (2006) explained that the staff of the National Bureau of Economic Research (2003, as cited in *Education Week*) found that, "despite significant Internet subsidies in California from 1996 to 2000, there was very little evidence to show that the expansion of Internet availability had a significant impact on student achievement in the Golden State" (p. 1).

Other researchers, such as Grant, Ross, Wang, Potter, and Wilson (2003) and Popejoy (2003), conducted studies to measure the effects of technology in classrooms. In observation of the students in a technologically integrated classroom, Popejoy admitted that it was difficult for most students to discern the information they retrieved from the Internet and, often, they used research that was misleading or unsubstantiated. In addition, Popejoy reported that students expressed great frustration when they tried to retrieve relevant information from the Internet, and it was difficult for many to stay on task when left to the Internet without immediate supervision. Grant et al. reported that, sometimes, the presence of technology in the classroom caused more trouble than it was worth. At times, the use of laptops in the classrooms was harder than paper and pen, and when the network was down, there were even larger problems for the users. In both studies, the limited findings indicated that the use of technology was a positive force in the classroom; however, none of the findings were significant.

Peck et al. (2002) conducted a study to investigate the use of computer technology in high school classrooms. After synthesis of the classroom data, the team realized the inconclusiveness of their results, because each teacher implemented technology in a different manner. In addition, Peck et al. concluded that most of the teachers they

observed used technology only as a support to their existing curricula, rather than replace, and that technique affected students on an individual basis which was too narrow to generalize across a population. Also, the students in the study admitted that, when they did use computers in their classrooms, usually, they completed only low end, teacher centered assignments such as word processed essays or work on reports instead of higher level thinking, student centered projects.

Meaningful Technological Integration

Through the decades, numerous researchers such as Peck et al. (2002), Popejoy (2003), Sivin-Kichala and Bialo (2000), to name a few, have found that technology has an impact on student achievement. However, the differences between the studies show that technology can have a profound effect on student achievement if implemented correctly (eMINTS 2006). According to Milken (1998), an advocate of technology integration,

> For it is our experience and belief that technology—properly managed and applied—provides the opportunity to restore rigor to children's learning, to rebuild public confidence in American education, and to help ensure that the equality of opportunity in which we pride ourselves as a nation has meaning. To pass up this opportunity amounts to a collective failure of responsibility to our youth. (p. 4)

The use of properly integrated technology can be beneficial to students in the classroom. The first step to properly integrate technology into the classroom is to train teachers to have the confidence and ability to make learning meaningful.

Teacher Training

According to Noeth and Volkov (2003), adequate teacher training can make or

break the impact of technology on students. The researchers explained that many schools have acquired an abundance of technology for the classroom. However, many teachers do not use it in the most appropriate manner to enhance learning. Noeth and Volkov reported that a great deal of student growth is dependent upon how well a teacher implements technology, and how well a teacher integrates technology depends on how well the teacher is trained. The researchers concurred that increased student achievement "depends on enhancing the technology skills of teachers and administrators" (p. 6).

Noeth and Volkov (2003) realized that there is a great deal of pressure on teachers and administrators to implement technology successfully into classrooms. The researchers' most critical finding was related to student achievement and preparedness as well as the skill level of those who employ it. Noeth and Volkov recommended that teachers needed high level professional development that would lead to a professional community that was centered around the integration of technology in a curriculum. Also, the researchers reported that, at a basic level, to ensure technological effectiveness, teachers must be able to: (a) use technology for personal productivity, (b) use technology to support student learning in a certain subject area, (c) design technology centered activities, (d) manage technology centered student activities, and (e) assess student skill level in the context of technology supported activities. Noeth and Volkov concluded that the use of technology vastly improved student learning when the teachers were confident and knowledgeable about technology.

Milken (1998), in his address at an educational conference, stated that student success relies largely on teacher training. That is, the key to student success "liberated

educators whose understanding and creative use of computers. . . to achieve undreamed-of levels of excellence for themselves and for their students" (p. 20). Milken explained that professional competency, based in staff education, would advance student learning. Milken believed that part of student success was the provision of equal opportunity to all students, and part of students' equal opportunity is to be able to work under a technologically knowledgeable teacher.

Part of the eMINTS program success rate has been attributed to lengthy teacher training (eMINTS, 2006). The focus of the eMINTS program is on teacher training to ensure student achievement. A first year teacher in the eMINTS program receives 100 hours of professional development, as well as a week long development experience. A second year teacher in the program receives 75 additional hours of professional development. After the professional development, an eMINTS instructional coach meets with the teachers once every 2 weeks and provides support, ideas, and updates. The teachers in the eMINTS classrooms are well trained, which gives them the ability to develop productive technologically integrated lessons.

Cheung (1996), in a paper presented at the University of Macau, stated that, "all teachers preparing for the information age should be conversant with knowledge and applications of information technology in a classroom teaching and learning" (p. 28). Cheung explained that the schools in Macau have revised their literacy programs entirely to reflect developments in technology. Furthermore, Cheung concluded that the first step in the integration of successful technology programs in schools is proper training of the teachers. Cheung reported that the schools in Macau were an example of successful

technological integration due to teacher training and focus.

In a comparative analysis conducted by Willis and Cifuentes (2005), they reported that teachers must be trained appropriately in their work with technology in order to successfully integrate it in to the classroom. However, teachers need to be trained in technology in order to develop a foundation of knowledge and ability. According to Willis and Cifuentes, the low level computer use in schools was likely a result of a lack of appropriate teacher training.

Willis and Cifuentes (2005) found that teachers' use of educational technological integration was related to educational experiences during training. In order to improve teacher understanding and confidence, they must be provided with training to ensure skill development and the modeling of innovative uses of technology to improve both teaching and learning.

Teacher Confidence

In a report issued by Coughlin and Lemke (1999) for the Milken Family Foundation, the authors described scenarios in which teachers were expected to successfully integrate technology in the classroom, but failed to do so because their training and confidence were too low. They maintained that the structure of most public schools worked against successful teacher training because, too often, teachers were isolated in their own classrooms, away from opportunities to collaborate. Coughlin and Lemke found that "Many excellent teachers view the use of technology as inefficient or unpleasant simply because they do not have basic skills of usage and troubleshooting" (p.

15). Because teachers did not have the adequate training necessary to increase their confidence, they became ineffective users of technology who would never learn how to effectively integrate technology into their classrooms.

Michaels and Johnson (2004) wanted to determine the types of technology that elementary teachers used in their classrooms, and how the teachers acquired their training. They found that most of their participants taught themselves how to use technology. Other participants took the initiative to take workshops to learn how to use technology, but very few participants had formal in-service training on technology. Michaels and Johnson reported that most of the participants were hesitant to use technology in their classrooms because they had very low technological confidence, based on insufficient training. The researchers implied that, until teachers were trained more assertively, the use of technology would stay at a basic level.

In their study, Moursund and Bielefeldt (1999) found that participants had low confidence and ability in regard to technological integration into schools. They observed that, until teachers are trained properly, technological integration will be ineffective and unproductive. Researchers at the U.S. Department of Education (1999, as cited in Moursund and Bielefeldt) concurred that:

> Teachers are being asked to learn new methods of teaching, while at the same time are facing even greater challenges of rapidly increasing technology changes and greater diversity in the classroom. . . [given such challenges] relatively few teachers (20%) report feeling well prepared to integrate education technology into classroom instruction. (p. 2)

Teacher confidence and knowledge affects the level of quality and integration that occurs in a classroom.

Tools and Methods for Success

Collaborative Software

McIntire (2005) focused on the Corpus Christi Independent School District (CCISD) and the success of teachers who met the state standards 3 years in a row. A key component to the success was the new curriculum and assessment management system from SchoolNet which allowed teachers to: (a) deliver online testing, (b) view diagnostic data, and (c) access relevant lessons. The relevant lessons that the teachers accessed came from other teachers within the district. McIntire reported that use of the SchoolNet program allowed teachers within the district to develop online communities in which they could share ideas and plans.

Also, McIntire (2005) reported that the participants in the SchoolNet program in the CCISD learned that there were strategies they could use for successful integration in a school. The strategies that McIntire listed were:

1. Take every measure possible to build commitment to the initiative by involving stakeholders in all stages of development
2. Make the system an indispensable component of teachers' daily routines by offering functionality that is responsive to the personal needs and values of users
3. Use open-standard tools available to all major technology platforms
4. Build capacity within each school to provide support, train new users, retrain existing users, and promote the benefits of sharing methods and materials. (p. 27)

Online collaboration, through the use of SchoolNet, allowed the CCISD teachers to integrate technology successfully because they could learn as a group and assist one another whenever appropriate.

Business Partnerships

In addition to online collaboration tools, Kinnaman (1992) pointed out the benefits of business and school partnerships. In a partnership, business can offer organization and management skills, along with a monetary donation, and education can offer learning theory and facilities. The author reported that both business and education shared a common goal, and both institutions benefitted from a better educated public.

Apple Computers (2006) offers a partnership much like what Kinnaman (1992) suggested. Apple Computers (1995) started the Apple Classrooms of Tomorrow (ACOT) in 1985 to research the effects of technology in education. From their research, the leaders of ACOT began to offer education products and collaboration tools that would help teachers in schools nationwide to achieve greater academic results. Today, Apple Computers offers a wide array of education tools, from computers in the school, to educational software, to training teachers, to one on one training with students and faculty. The goal of Apple Professional Development is to make schools more technologically advanced and successful.

Another organization that assists schools in achievement through technology is the eMINTS program (2006). The leaders associated with eMINTS stated that their goal was to "transform education for all learners through high-quality teaching powered by technology" (p. 1). The eMINTS National Center supports educators all over the country by the integration of multimedia technology into student centered practices. The Center serves as a resource for schools and districts across the U.S. that want to integrate technology successfully.

The staff of the Milken Family Foundation (2006) established the Teacher Advancement Program (TAP) in order to assist schools in increasing achievement. The TAP is focused on training teachers and allowing teachers to collaborate during contract hours in order to bring the most effective and proven methods into their classrooms. In the TAP, teachers are trained in the realm of technology to make sure they are confident and skilled in the technology they choose to use in their classrooms. In TAP, teachers are encouraged to work together to achieve gains in technology and in student achievement.

Tools

Branzburg (2006) explained how the use of interactive whiteboards, or SMART Boards, can make students more engaged in the classroom. According to Branzburg, "when hooked up to a computer, the whiteboard's screen becomes a live computer desktop" (p. 31). Branzburg explained that the SMART Board did everything that a computer could do, with the touch of a finger, for the whole classroom to see. The SMART Boards can be used in a variety of ways to motivate students. According to Branzburg, students can use them for: (a) presentations and projects, (b) web-streaming and videos, (c) Internet exploration, (d) manipulative learning, as well as (e) technology education. Branzburg reported that teachers used SMART Boards to encourage critical thinking and, also, used it with students with special needs as the enlarged, colorful font and display encouraged participation.

According to eMINTS (2006) staff, a successful classroom should consist of: (a) a teacher laptop and workstation; (b) a SMART Board and projector; (c) a scanner,

printer, and digital camera; (d) one computer for every two students in Grades 3-6, and (e) educational software. With access to all of these types and levels of technology, students have a greater chance of being more successful in their educational career. The eMINTS staff maintain, that with the use of this technology, test scores will increase, and educational opportunities will be more equal across gender, ability, and racial divides.

Dick (2005) recommended ways to integrate technology into the classroom at a basic level. Dick stated that "technology is the key to improving student achievement, but without high-quality professional development, technology will never be successful in fulfilling that role" (p. 31). Dick explained that teachers could use the Internet for research and ideas for lesson plans. Also, the use of PowerPoint, Kidspiration, Accelerated Reader, and Kid Pix allow students and teachers the opportunity to incorporate easy technology into their day. In addition digital cameras and scanners are useful forms of technology to have in the classroom. Dick emphasized that these types of technology cost relatively little and are easy and basic forms of technology to use in the classroom to keep students engaged.

Chapter Summary

The usefulness and appropriateness of technology in the classroom was presented in this chapter. Also, the barriers to technology integration as well as meaningful methods and tools for integration were presented in this chapter. It is apparent that if integrated appropriately, technology can enhance student learning. Also, it is apparent that teacher confidence and training is imperative to successful technology integration in

implemented correctly, could increase student achievement, involvement, and confidence in the learning environment. The information presented in Chapter 2 will assist educators in understanding the value of technology in the classroom. In Chapter 3, the method for this project will be explained.

Chapter 3

METHOD

The purpose of this project was to inform elementary school teachers and district officials about technology integration in the classroom in the form of an inservice. In many school districts across the United States, substantial portions of the budgets have been allocated to technology for the classroom. However, what these officials have not spent much money on is teacher training to enhance confidence so that the teachers will use the purchased technology. In order for the use of technology to enhance student performance in the classroom, there must be an effective teacher in the room, who knows how to teach students how to make the most of the technology.

In addition to informing teachers and district officials about the benefits of the use of technology in the classroom and the importance of teacher training, this researcher informed the audience of ways to integrate technology into their classrooms. There are various types of technology that will enhance the classroom learning environment.

Through this presentation, this researcher hoped to reach teachers of all experience levels, as well as district officials, and educated them about ways to increase teacher and student confidence in the classroom. Technology is the way of the future, and there is no better time to introduce various types of technology into the life of young students than now.

Target Audience

The target audience of this presentation was elementary school teachers in Grades K-5. In addition, school principals as well as district officials were the target audience of this presentation. In order for a deeper understand of technology integration in the classroom, both the teachers and officials needed to be present. Teachers knew what they are willing to do, and officials knew what they were able to provide in terms of time allotment for training.

Goals

There were three main purposes for this presentation. The first purpose of this presentation was to inform teachers and district officials of the benefits of technology integration in the classroom. This presenter of the information provided factual evidence to the audience to support the use of technology in the classroom.

The second purpose of this presentation was to educate the audience as to why more teachers do not integrate technology in their classrooms. Even in this technology driven society, many teachers refrain from the use of technology in the classroom. Most teachers do not feel that they have adequate training in technology, and that is the primary barrier between teachers and technology. Because the target audience is now aware, perhaps they might recognize the problem in their own districts and make changes.

The third purpose of this presentation was to inform the target audience about ways that they can integrate technology in the classroom. There is a wealth of information concerning ways to integrate technology, but it may be daunting and time

consuming to peruse. This researcher compiled these resources into one concise brochure and presentation that will help the participants to find ways to use technology to enhance their classrooms.

Assessment

The presenter of this information had several experienced teachers review the PowerPoint and brochure and give informal feedback.

Chapter Summary

The purpose of the project, the target audience, and the method were discussed in this chapter. The compilation and application of information in the form of a brochure and presentation will be presented in Chapter 4. Discussion of the feedback and success of the delivery will be presented in Chapter 5.

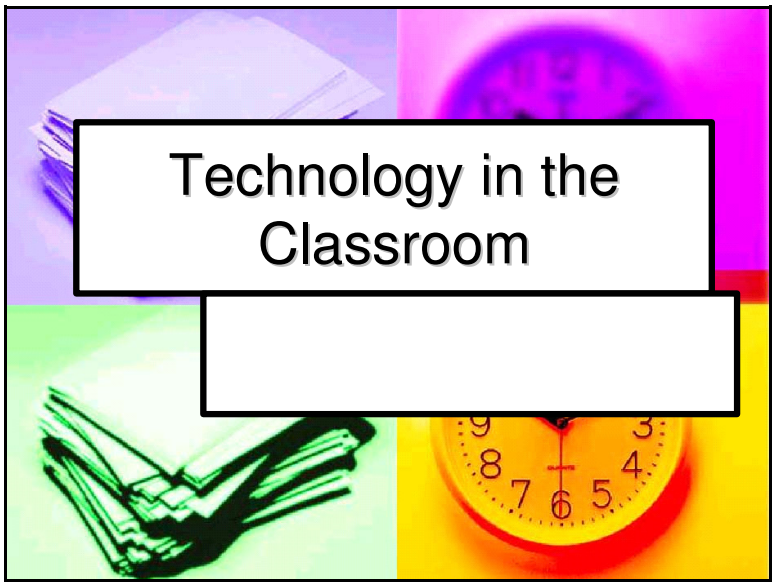
Chapter 4

RESULTS

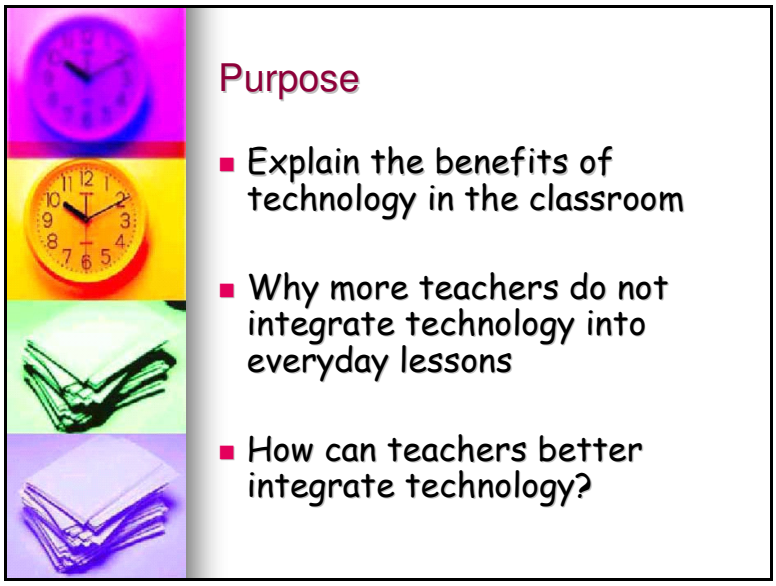
A teacher that integrates technology in the classroom creates a more effective, productive, and higher-level thinking environment. Published researchers (Noeth and (Bajcsy 2002;Volkov 2004; eMINTS, 2005) indicate that the use of technology enhances the overall classroom environment as well as student achievement on informal as well as formal testing. Additionally, researchers concluded that the use of technology helps students that are low achieving, are at risk, or who are disabled the most. Other researchers (Cheung , 1996; Milken, 1998; eMINTS, 2006) reported that in order for the use of technology to be effective, the teachers implementing the technology must be adequately trained. Without proper training, the use of technology could be of indeterminable usefulness.

The goal of this inservice was to inform educators that the use of technology is useful if implemented correctly. Training and confidence are essential to effective technology use in the classroom, and the author conveyed this to the audience. The final goal of this inservice was to inform educators of ways to integrate technology into the classroom. This author is hopeful that educators will recognize the validity and value of technology in the classroom setting.

Prior to the presentation, this author asked the audience to complete a survey about technology. The survey is attached in the Appendix.



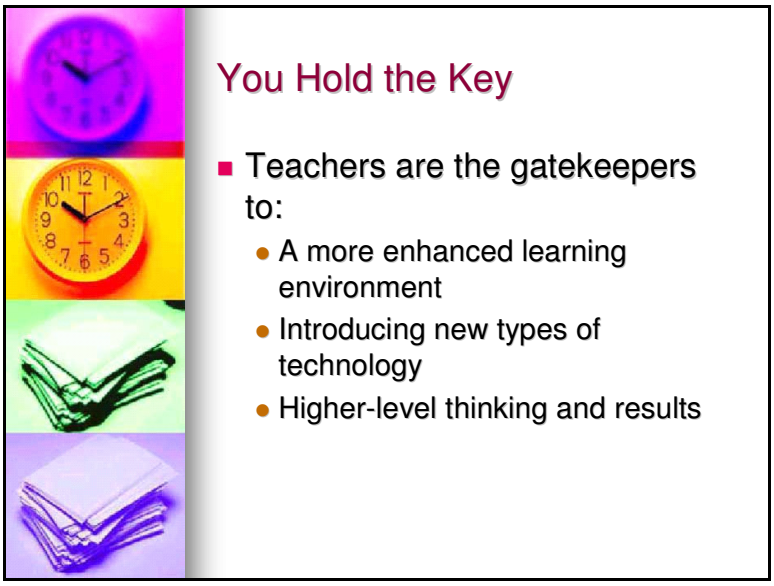
In this technologically savvy society, we are realizing the importance of teaching students at a young age about technology. There are so many different ways that technology can make our lives easier, precise, and more efficient. College graduates are expected to have an extensive background and knowledge in technology, and it is our job, at an early age, to introduce our students to this technology.



The purpose of my presentation is to explain how positive technology can be in a classroom setting. I want to share published research with you that indicates the need for technology in the classroom. Competency in technology is a necessity in society today, and the best place to initiate use of technology is in an elementary classroom.

Also, I want to explore some barriers to using classroom technology. Research proves that teachers are hesitant to use technology because they are not adequately trained and therefore do not have the confidence they need to be able to use technology successfully in the classroom.

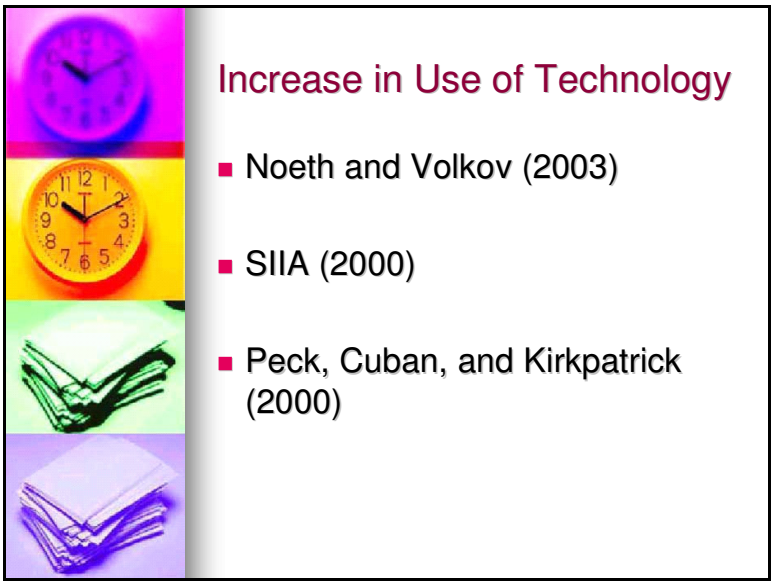
Finally, I want to tell you about some ways to integrate technology in the classroom. These days, there are so many programs and tools designed to make technology integration easier and more successful for teachers and students alike.



Teachers are what make the world go round. Teachers hold the key to students' learning and success. Teachers influence students at such an early age, and now they have the ability to use technology in a way that will make students more successful in society.

By integrating technology into the classroom, teachers are creating a more enhanced learning environment. Technology integrates tactile, auditory, and visual learning. Teachers are able to reach more students by integrating technology into lessons. Giving students the choice of typing a paragraph versus writing a paragraph boosts confidence, results, and efficiency.

Integrating technology such as the Internet, PowerPoint, digital cameras, and scanners will enhance the work of the students and keep them engaged and exploring new ways to solve problems. Additionally, by allowing students to explore technology in the classroom, teachers assure students that the information they retrieve is current.



According to the report issued by ACT (2003, as cited in Noeth & Volkov, 2003), access to computers and the Internet has skyrocketed in most schools. School connectivity has grown from 35% in 1994 to 99% in 2001. In another report issued by the Software Industry Information Association (SIIA; 2000), spending has almost tripled for instructional technology in the past decade. In the 1991-1992 school year, school administrators spent approximately $2.1 billion on technology in comparison to over $6.2 billion in the 1999-2000 school year. That amount has since skyrocketed as well as we enter an even more technologically dependent era.

According to a report issued by Peck, Cuban, and Kirkpatrick (2000), Internet connectivity and access to the Internet has become a national priority since 1990. In 1983, there were 92 students per computer. In 1989, there were 27 students per computer, on average. In 1999, there were only 6 students per computer, and these days,

we see anywhere from 3 down to 1 student per computer. By 1999, over 90% of schools nationwide were connected to the Internet.

As you can see, funding for technology has risen substantially over the past couple of decades. There is more access now than ever to computers, and there are less students per computer than ever before. School administrators have recognized the need for technology in the school.

There are, however, researchers who reported that technology is an unknown to academic improvement. While many support educational technological integration in the classroom, some have questioned the effectiveness of technology. In a study conducted by Noeth and Volkov (2003), the researchers warned that if technology was not implemented correctly, it might actually hinder student performance. Other researchers observed that the impact of technology on a student is just too difficult to quantify.

That being said, there are success stories and research that indicate otherwise. I would now like to introduce you to a program called eMINTS, a true success story.

eMINTS stands for Enhancing Missouri Instructional Networked Teaching Strategies. The staff of eMINTS is committed to equipping classrooms with appropriate technology, training staff to successfully use the technology, and then measuring the gains that the students make because of the technology. The eMINTS program has been successfully implemented in Missouri, Utah, Maine, Nevada, and Illinois. The goal of eMINTS is to "transform education for all learners through high-quality teaching powered by technology" (p. 1). The researchers at eMINTS reported that technology, if implemented properly, can increase student achievement.

The eMINTS program contains over 22,500 students between the 5 states. Each classroom is equipped with a teacher laptop and workstation, a SMART Board and projector (in case you were not aware of what a SMART Board is, I am projecting this presentation to you on one right now...), one computer for every two students in Grades 3-6, one to one laptops in middle and high school, and Microsoft Office (a mapping tool and multimedia editing tool). The purpose of an eMINTS classroom is to establish a learning environment that is complete with differing levels of technology to advance student awareness and achievement. The training for teachers is extensive, and because of successful integration and implementation, results from an eMINTS study indicate that the use of this technology has improved student achievement.

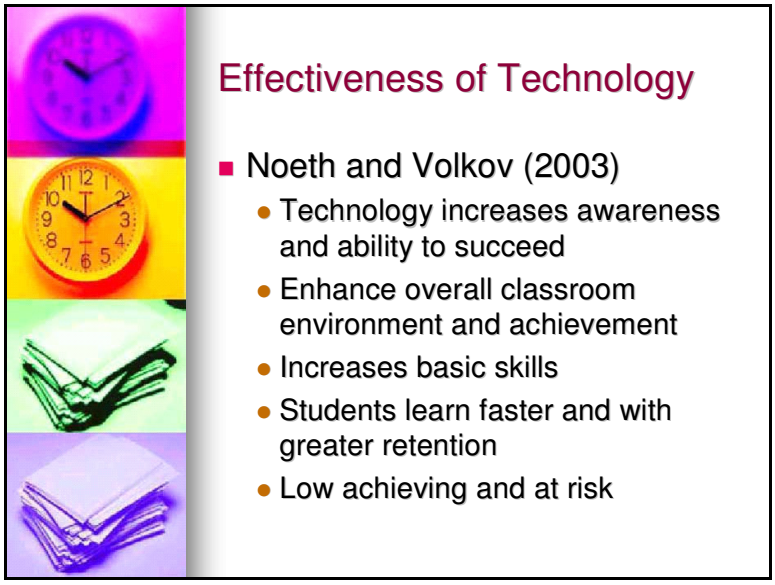
The researchers at eMINTS conducted a 4 year study against students who were not enrolled in an eMINTS classroom. The researchers reported statistically significant data that prove that students in an eMINTS classroom score higher on most state tests

than students not enrolled in an eMINTS classroom. In addition, researchers found that generally, low income and special education students scored higher on state tests when enrolled in an eMINTS classroom than their peers that were not.

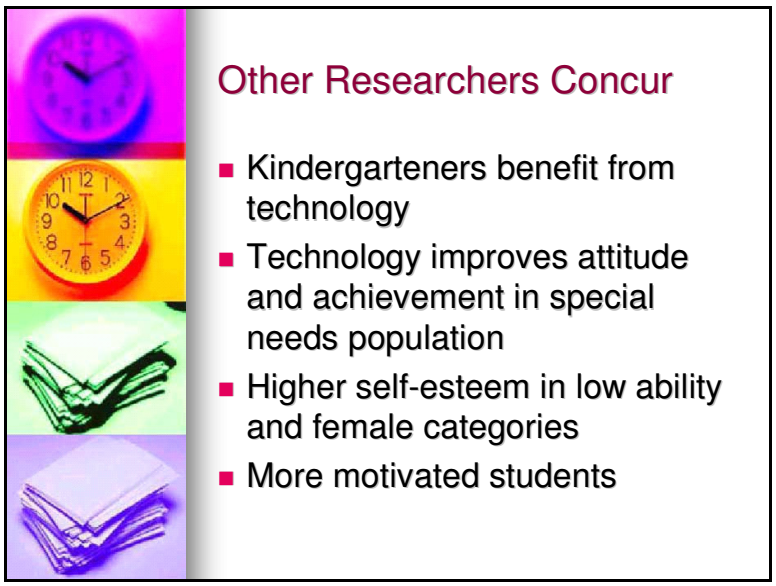
Some additional rewards that resulted from the study indicated that enrollment in an eMINTS classroom reduced the deficit for low income students by about 45% and reduced the overall difference for special education students by about 53%. In these eMINTS classrooms, the playing field was leveled for low income students who may not have access to computers at home, and also for the special education students who might not otherwise receive training in these technologies. The study also proved that the integration of technology greatly increased technology skills among teachers and students, student attendance increased, behavioral referrals decreased, and parental involvement increased.

As you can see, technology, in this instance, not only increased student achievement, but gave low income and special education students opportunities they might have otherwise missed out on. Test scores reportedly increased, as well as overall student performance, in an academic sense as well as a social sense. Perhaps this is a program you may want to investigate for your own school district.

eMINTS is just one success story. I will now introduce you to other researchers who indicate that technology increases student achievement.



According to Noeth and Volkov (2003), teachers need to use technology to improve learning in schools. The researchers stated that the use of technology enhances overall classroom environment as well as student achievement. In addition, the researchers found that when technology was combined with traditional instruction, basic skills increased. Noeth and Volkov reported seeing students learning faster and with greater retention when they used computers than when they did not use technology. Finally, the researchers demonstrated that low achieving and at risk students benefitted the most from technology .



I read a study conducted by Sivin-Kachala and Bialo (2000) in which they tracked student progress through the 1980s through 2000 and concluded that students benefit from the use of technology. The researchers found that kindergarten students who used technology benefitted in: (a) conceptual knowledge, (b) reading comprehension, (c) reading vocabulary, and (d) creativity. Also, the researchers reported that the use of technology greatly improved the attitude and achievement of the special needs population. Finally, they found that students that worked with technology in the classroom had higher self-esteem and better altitudes toward learning, especially in the low ability and female categories.

Researchers at the Software Information Industry Association (SIIA; 2000) concurred with prior evidence that technology positively influences student achievement. These researchers reported that students who used technology were more motivated and had higher self-esteem and self-confidence. The researchers at SIIA noted their most substantial finding in the area of technology and the special needs population.

As you can see, there have been a plethora of studies conducted in order to find out if the use of technology is effective in the classroom. Researchers prove time and again that technology does play a role in increasing the overall educational experience of a student. The use of technology increases academic achievement, as well as social achievement.

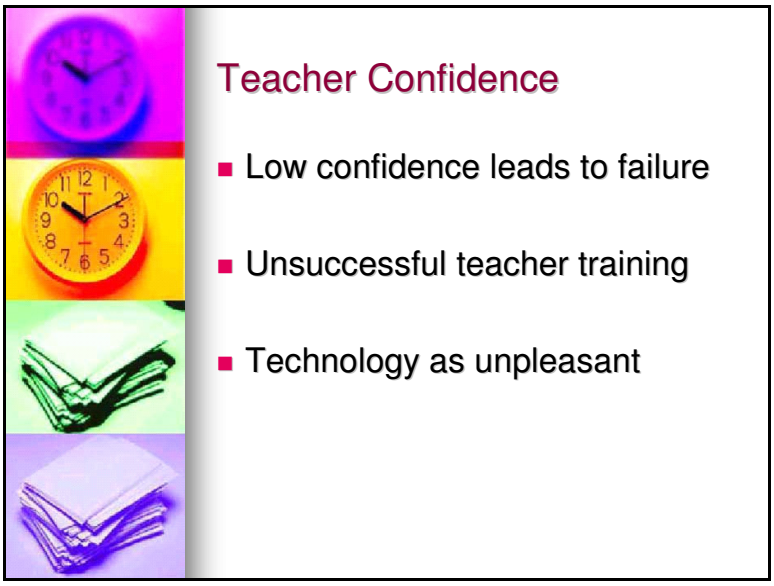
Noeth and Volkov (2003) reported that many schools have acquired the appropriate technology for the classroom, but many teachers do not use it in the most appropriate manner. The researchers found that although the classroom was well equipped, the teacher delivering the lesson was not. The researchers emphasized that without adequate training, the technology in place might actually get in the way of effective teaching and learning. The researchers concurred that student achievement depends on increasing the skills of the teacher delivering the information.

Likewise, the researchers emphasized the great pressure placed on teachers these days to implement technology successfully. Noeth and Volkov recommended that districts offer professional development at a very high level that would foster a knowledgeable professional community centered around technology. The researchers also reported that teachers, in order to effectively integrate technology, must be able to use technology for personal productivity, to support student learning, design and manage

technology centered lessons, and assess student skill level in the context of technology. The researcher concluded that the use of technology vastly improved student learning when the teachers were confident and knowledgeable about technology.

I want to revisit the eMINTS program success that we explored earlier. Part of the eMINTS (2006) program success rate has been attributed to extensive teacher training. A first year teacher receives 100 hours of professional development as well as a week long development experience. A second year teacher receives 75 additional hours of professional development. After the formal training, an eMINTS coach meets with teachers once every 2 weeks to provide support, ideas, and updates. The eMINTS teachers are very well trained, which gives them the confidence to deliver lessons that appropriately integrate technology.

It is obvious that in order to successfully integrate technology into your classrooms, you must first devise a plan to extensively train your staff.



If teachers are not trained properly, they lack the confidence necessary to successfully integrate technology into the classroom. I came across a report issued by Coughlin and Lemke (1999) in which the researchers reported that teachers were expected to integrate technology into the classroom, but failed to do so because their training and confidence were too low. The researchers found that teachers are too often isolated in their own classrooms, away from opportunities to explore and collaborate on new technology. Coughlin and Lemke found that "many excellent teachers view the use of technology as inefficient or unpleasant simply because they do not have basic skills of usage and troubleshooting" (p. 15). Because teachers are not trained adequately, their confidence, and therefore performance are low.

The first step to increasing student achievement through the use of technology is to make sure your staff is prepared to facilitate the environment. I can not emphasize this point enough; training fosters success.

As a quick interlude, I would like to demonstrate what a little training can do! Can I please have a volunteer come up to the SMART Board with me? Thank you! Now, please show me what this SMART Board is capable of. What do you mean you do not know how to use it? What is the problem? The SMART Board is waiting here for you to use it, why are you having problems? (Let the volunteer sit down)

This little example demonstrated how I felt a couple of months ago. The PTA was kind enough to supply one SMART Board per grade level, but omitted the training piece of the puzzle. SMART Boards are powerful machines, if you are properly trained. Honestly, the SMART Board sat in the corner of my room until I took the initiative to seek help and train myself to use it. Now, look at all the neat things I can do. (At this point, the presenter will give a 5 minute display of how to integrate a SMART Board into the classroom).

I found an article written by McIntire (2005) in which he focused on the Corpus Christi Independent School District and the success of teachers who met the state standards 3 years in a row. McIntire reported that a key component to the success was a collaborative software which allowed teachers to deliver online testing, view diagnostic data, and access relevant lessons. The lesson that the teachers retrieve came from other teachers within the district. McIntire explained that the collaborative software, called SchoolNet, allowed teachers within the district to develop online professional communities in which they could share ideas and lessons. How many of you think you might benefit from a software that would grant access to fellow teachers' lesson plans? I know I would. Collaborative software is one way to start integrating technology at the professional level to increase confidence, efficiency, and effectiveness.

Business partnerships are another way to integrate technology into a school. I read an article written by Kinnaman (1992) in which he explained the benefits of business and school partnerships. In a partnership, businesses can offer a school organization,

funding, and management skills. Education can offer learning theory and facilities. Kinnaman reported that both business and education shared a common goal, and both institutions benefitted from a better educated public.

I want to revisit eMINTS for a final time as an organization that exists to help schools achieve through technology. The staff of eMINTS supports educators all over the country and serves as a resource for districts across the U.S. that want to integrate technology successfully.

An organization that I stumbled upon has teachers in mind. The Milken Family Foundation exists to serve public education as a broker of research, analyses and insight into the effective use of technology in teaching and learning. The staff of the Milken Family Foundation created the Teacher Advancement Program (TAP) in order to help students increase achievement. The TAP trains teachers and allows teachers to collaborate during contract hours in order to bring the most effective and proven methods into the classroom. Teachers are trained in the realm of technology to make sure they are confident and skilled in the technology they choose to implement. TAP helps teachers become more confident facilitators of technology in the classroom. There are many other programs like these that exist to train teachers in technology.

Another business partnership I found while investigating the topic was Apple Computers. Apple (2006) offers a partnership called Apple Classrooms of Tomorrow (ACOT) in 1985 to research the effects of technology in education. From their research, the leaders of ACOT began to offer educational products and collaboration tools that help teachers achieve greater academic results. Apple Computers offers a wide array of

educational tools, from hardware, to software, to training and one on one development. Apple Professional Development exists to make teachers and students more technologically sound. I have a brochure that I will pass out at the end that has all of the contact information for these business partnerships (located in Appendix).

Aside from collaborative software and business partnerships, I investigated different types of technology that teachers can integrate into the classroom. SMART Boards, as you have experienced, are wonderful machines that can be used in a multitude of ways to motivate students. Students can use the SMART Board for presentations and projects, web-streaming and videos, Internet exploration, manipulative learning, and technology education. SMART Boards also assist with special needs students because of the enlarged, colorful font and display which encourage participation.

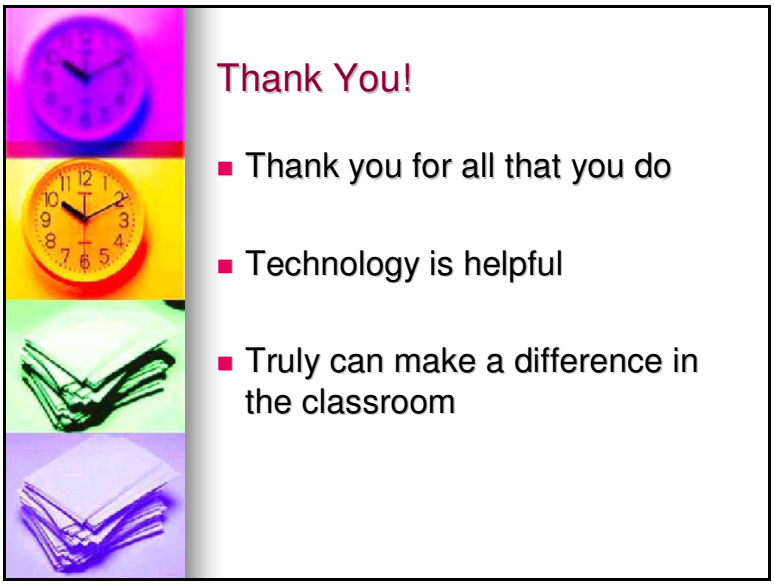
Having used a SMART Board in my own classroom, I can honestly say they make learning very fun and engaging. The class can read a book together, and then I can find a website that has fun games that correspond to the book. Groups at a time, the students can come up and interact with each other and the SMART Board to answer questions about the book. Students love to have the chance to have an interactive lesson.

According to the eMINTS (2006) program, a successful classroom should consist of a SMART Board, a scanner, printer, digital camera, laptops, and access to the Internet. All of the types of technology are easy to use once trained on, and can open up a world of learning and motivation to the students.

Additionally, Dick (2005) recommended ways to integrate technology at the basic level. Start with the Internet to let students and teachers explore different topics for

projects and lesson plans. Also, Dick explained that PowerPoint, Kidspiration, Accelerated Reader, and Kid Pix allow students and teachers the opportunity to incorporate easy technology in their day. Again, I will hand out a brochure at the end of our conversation today that explores these options in greater depth.

As you can see, there are a variety of ways to integrate technology into a classroom, from a basic level, to a fully loaded classroom. Of course, even at the basic level, teachers must be adequately trained in order to most effectively disseminate the information at hand.



I want to take this time to answer any questions you might have, and I also want to thank you for all that you do! Technology really can be a blessing in the classroom, for students and teachers alike. Thank you very much for your time, and now I will pass out the brochures and I will be happy to answer any questions.

Chapter Summary

Researchers have proven through the years that technology is an effective tool for maximizing student potential. Although district officials are better equipping classrooms with the technology they need, teachers are hesitant to use the technology set forth because of a lack of training. The lack of teacher training leads to low confidence levels among staff, and ultimately incorrect use of or no use of classroom technology. It was the purpose of this author to help educators understand the need for technology, as well as the importance of adequately training the staff to incorporate technology into the classroom. This author presented, in an inservice, published research and studies that confirmed that technology increases student achievement. The discussion of this applied project as well as the limitations to the project will be presented in Chapter 5.

Chapter 5

DISCUSSION

The use of technology in the classroom can enhance the learning environment and increase student achievement. Teachers that are adequately trained and who use technology effectively can create lasting impressions, and connect with students that might have otherwise been overlooked. The use of technology can improve test scores, overall confidence and comprehension, as well as improve attitudes and attendance. Appropriate use of technology can also give low achieving students and special education students the chance to succeed at a higher rate. In this technologically savvy society it is essential for students to be prepared in the realm of technology. Early integration of technology creates a foundation on which the students can build upon during their educational career. It was the intent of this author to inform teachers and administrators about the importance of technology integration into classrooms.

Objectives Achieved

This author had the opportunity to deliver information in the form of an inservice and informational brochure to teachers and administrators. The main objective of this author was to successfully educate the audience about the usefulness of technology in the classroom. The audience first realized how the use of educational technology can enhance student learning and achievement. The teachers and administrators also learned that the first step to effective technological integration in the classroom is heightened

teacher confidence through appropriate technological training. The audience discovered that district funding for technology is only the first step to successful technological integration. The use of educational technology is useless if the teacher implementing the technology does not have the proper training.

In addition, the audience learned that implementing educational technology does not have to be daunting. There are numerous ways to integrate technology into the classroom, starting with a digital camera, moving up to a SMART Board. The teachers and administrators found that they could also seek out business partnerships to enhance the available technology in the schools. Overall, this author demonstrated the need for technology in the classroom, the need for appropriate teacher training, as well as the different ways to integrate technology into the classroom.

Assessment of the Project

This author presented this project to teachers and administrators of the school in which she worked. This author asked three professional staff members, comprised of two teachers, and one administrator to assess the quality, validity, and usefulness of this project. All three assessors agreed that the project was useful, informative, and effective.

Limitations to the Project

The largest limitation that this author experienced when conducting research for this project, was the lack of substantiated evidence researchers found that proved quantitative significance relating technology use and student achievement. Although

most studies pointed to increased student achievement, few researchers reported statistical significance.

The use of technology in the classroom can be very effective and enriching if the proper technology is integrated, and the teacher is adequately trained on the technology. In order to make technology integration successful, administration and teachers alike must be willing to budget both substantial amounts of time and money, which may be unrealistic for some participants.

Additionally, through extensive research, this author discovered numerous ways to integrate technology into the classroom. Because of the nature of this project, this author was able to only introduce some of the many ways in which to successfully integrate technology into the classroom. Further research by administration and teachers upon implementation would be necessary in order to find types of technology that best fit the needs of the participants.

Recommendations for Future Research

As mentioned in the limitations to the study, there is a lack of substantiated, quantitative evidence that links the use of technology to increased student achievement. Although most studies indicate that students who use technology are generally more successful, more research could be helpful in proving the effectiveness of technology use.

Additionally, studying the effects of different types of technology use on student achievement would be beneficial. Although there are researchers who have studied the general effects of technology use on student achievement, actual links to specific types of

technology use might be intriguing. This author feels confident that acquiring quantitative data that support technology use in the classroom will be the first step in better equipping schools all over the nation, giving teachers the ability to create more aptly achieving and prepared students for the future.

Project Summary

The first purpose of this project was to explore the effects that technology use had on student achievement. This author found, through extensive research, that the use of technology has a positive effect on student achievement, confidence, test scores, attitude, and overall the student experience.

The second purpose of this project was to deliver the material to an audience of teachers and administrators. This author successfully informed teachers and administrators that the use of technology in the classroom is both effective and necessary in producing productive members of the classroom and society. In addition to the effectiveness of technology on students, the target audience learned that technology comes in all different forms, and the first step to creating a successful technologically integrated classroom, is teacher training and confidence.

REFERENCES

Apple Computers. (1995). Teaching learning and technology: A report on 10 years of ACOT research. *Apple Education*, 1-24. Retrieved January 30, 2006 from http://www.apple.com

Apple Computers. (2006). *Apple professional development*. Retrieved January 30, 2006, from http://www.apple.com

Branzburg, J. (2006). Use an interactive whiteboard: Get a handle on how this technology can spice up a classroom. *Technology & Learning, 26*(6), 31. Retrieved February 12, 2006, Infotrac database.

Cheung, K. (1998). Educating teachers for the information era. *Educational Media International, 35*(4), 25-30.

Coughlin, E., & Lemke, C. (1999). Professional competency continuum: Professional skills for the digital age classroom. *Milken Family Foundation*, 1-2. Retrieved February 12, 2006, from http://www.mff.org

Cuban, L. (2001). *Oversold and underused: Computers in the classroom* [Electronic version]. Cambridge, Massachusetts: Harvard University Press. Retrieved January 19, 2006, from http://www.hup.harvard.edu/pdf/CUBOVE.pdf

Dick, D. (2005). Clearing hurdles. *Learning & Leading with Technology, 32*(6), 31-34. Retrieved January 30, 2006, from Infotrac database.

Education Week. (2006). Technology in education. Retrieved January 12, 2006, from http://www.edweek.org/rc/issues/technology-in-education

Enhancing Missouri Instructional Networked Teaching Strategies(eMINTS). (2006). eMINTS across America. Retrieved January 9, 2006, from http: //www.eMINTS.org

Enzer, M. (2003). *Glossary of internet terms.* Retrieved January 10, 2006, from http: //www.matisse.net/files/glossary.html

Grant, M., Ross, S., Wang, W., Potter, A., & Wilson,Y. (2003). A modified laptop program: Putting the carts in the classrooms. Association for Educational Communications *and Technology,* 319-327. Retrieved January, 19, 2006, from ERIC database.

Johnson, A., & Michaels, B. J. (2004). What teachers use; what teachers want. *Association for Educational Communications and Technology,* 648-357. Retrieved January 19, 2006, from ERIC database.

Kinnaman, D. (1992). Why partnerships? *Technology and Learning, 12*(5), 4-9. Retrieved January 30, 2006 from Infotrac database.

McIntire, T. (2006). Share and share alike: Educators can share methods and materials with greater ease. *Technology & Learning 26*(6), 26-28. Retrieved January 30, 2006, from Infotrac database.

Milkin, L. (1998). *Learning technology: The opportunity and responsibility*. Retrieved February 15, 2006, from http://web.mff.org/pubs

Noeth, R., & Volkov, B. (2003). *Evaluating the effectiveness of technology in our schools.* ACT Office of Policy Research 1-17.

Peck, C., Cuban, L., & Kirkpatrick, H. (2002). Techno-promoter dreams, student realities. *Phi Delta Kappan, 83*(6), 12-23.

Popejoy, K. (2003). Technology integration in an elementary science classroom: Its impact on teaching and learning. *National Association for Research in Scinece Teaching, 2-9.* Retrieved January 19, 2006, from ERIC database.

Reese, J. (2005). Making a difference one student at a time. *The Journal, 32*(12), 19-20.

Schacter, J. (1999). The impact of education technology on student achievement: What the most current research has to say. *Milken Family Foundation*, 1-2. Retrieved February 12, 2006, from www.mff.org

Software and information Industry Association (SIIA). (2000). 2000 Research report on the effectiveness of technology in schools: Executive summary. *Software & Information Industry Association*, 1-8. Retrieved January 19, 2006, from http://www.siia.net

Sivin-Kachala, J., & Bialo, E. R. (2000). *Research report on the effectiveness of technology in schools.* Washington, DC: Software and Information Industry Association.

U.S. Department of Education, (2000). Computer technology in the public school classroom: Teacher perspectives. *National Center for Education Statistics*, 1-3. Retrieved January 19, 2006, from http://nces.ed.gov

USDA Food and Nutrition Services (2006). School meals. *Food Nutrition Services.* Retrieved February 19, 2006, from http://www.fns.usda.gov/cnd/FRP/frp

Waxman, H. C., Connell, M. L., & Gray, J., (2002). A quantitative synthesis of recent research on the effects of teaching and learning with technology on student outcomes. *Northwest Regional Educational Laboratory*, 1-28.

Willis, J., & Cifuentes, L. (2005). Training teachers to integrate technology into the classroom curriculum: Online versus face to face course delivery. *Journal of Technology and Teacher Education, 13*(1), 43-64.

APPENDIX A: TECHNOLOGY SURVEY

Technology Survey

1. How often do you use technology in your classroom?

_____

2. Do you feel as though you have adequate training on the technology you currently use?

_____

3. Do you feel like your school has up to date technology available for use?

_____

4. What types of technology have you been formally trained on?

_____

_____

5. What is keeping you from using more technology in the classroom? Confidence?

_____

6. What types of technology would you like more formal training on?

_____

7. What types of technology would you like to see more of in your school?

_____

8. Do you think technology is important in the classroom?

_____

_____

APPENDIX B: BROCHURE

Tools for *Success*

- **Tools:**
  - SMART Boards
  - Digital Cameras
  - Educational Software
  - Laptops
  - Scanner
- **Collaborative software:**
  - Allows teachers to deliver online testing, view diagnostic data, and access relevant lessons
  - Online collaboration created professional learning communities
    - SchoolNet
- **Business Partnerships:**
  - Businesses can offer organization and management skills, along with monetary donations
  - Education can offer learning theory and facilities
    - Apple Professional Development
    - eMINTS
    - Milken Family Foundation

Megan O'Malley

Regis University

May 2006

From **Chalk** Boards to **SMART** Boards

Technology in the Classroom

TECHNOLOGY IN THE CLASSROOM: *DOES IT BELONG?*

- *Students* depend on teachers to instruct them and expose them to the most current, up to date, and effective types of information
- Through the *guidance* of technologically confident and prepared teachers, students can achieve higher levels of thinking and more enhanced learning experiences
- *Teachers* are under scrutiny for their lack of technological integration in the classroom at the primary level
- Teachers report that a lack of:
  - Confidence
  - Training
  - Budget
  - Resources

  …prevent them from integrating technology in the classroom

INCREASED ACHIEVEMENT

- Statistically significant differences for students in grades 3 and 4 who worked with technology in the classroom:
  - Higher test scores
  - Low income and special needs students scored higher
  - Increased student motivation and confidence
  - Higher-order thinking and questioning skills
  - Improved behavior and attendance
  - Students learn faster and with greater retention

EFFECTIVE *INTEGRATION*

- Adequate teacher training can make or break the impact of technology on students
- Student growth is dependent upon how well a teacher implements technology
  - A teacher implements technology successfully if she is adequately trained
- To ensure technological effectiveness, a teacher must be able to:
  - Use technology for personal productivity
  - Use technology to support learning
  - Design technology centered activities
  - Manage technology centered student activities
  - Assess student skill level in the context of technology supported activities
- Technological integration success rate is attributed to:
  - Extensive teacher training, including over 100 hours of professional development in the first year