Improving Technology Integration at the Middle School Level

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Abstract

Technology integration is becoming a major component within the Alberta Education system, yet teachers are having problems successfully implementing it into their curriculum. These problems may be caused by several issues, including a lack of education in the area, attitudes towards technology, or lack of a successful technology integration plan within a school or school division.

Within this research, the writer discusses problems that may prevent a school from implementing a successful technology integration program within a school, and ways that a successful plan can be incorporated using people and resources that are already available within a school.
Chapter 1: Introduction

Problem Statement

The problem is teachers within an Alberta middle school are not given adequate training to use new technology that is provided for education, within a regular classroom. Christensen (2002) believes that educating teachers in the field of technology integration is the key factor for its successful implementation.

Purpose

The purpose of this study is to determine if there are logical ways that educators can implement educational technology within the classroom without overburdening the demands on teachers. It is important teachers take advantage of the technology that is given to them in the school, but it is also imperative that teachers are given the opportunity to learn this in a way that is cost effective for a school, and gives teachers the best chance to succeed with this new learning.

Description of Community

The community of Spruce Grove, Alberta, is a rapidly growing city in Northern Alberta, and is located approximately 10 kilometers away from the major city of Edmonton, Alberta. The schools within Spruce Grove are a part of the Parkland School Division, including the school within this project, Alberta middle school. The community is experiencing a rapidly growing population boom, and the population currently stands at approximately 18,000 people. Within Parkland School Division, which is mainly made up of small rural schools, Spruce Grove is the largest city. Due to the fact that it is the largest center within Parkland School Division, it is central to where many of the education initiatives of the city are taking place. Much of the in-servicing for new
education initiatives take place within the majority of schools in Spruce Grove. There are also many pilot projects that take place within the school division, including an initiative where Parkland School Division is currently working with IBM Canada, implementing technology into the mathematics curriculum.

Over the past several years, Parkland School Division has experienced a tremendous amount of growth that mirrors the population boom of the area. This is due mostly to the thriving oil industry around the area and located mostly in this northern area of Alberta. Parkland School Division consists of 22 schools: 3 early years schools (K-4), 3 elementary schools (K-6), 2 middle years schools (5-9), 2 senior high schools (10-12), 11 elementary/middle school schools (K-9) and 1, Kindergarten to Grade 12 School. Parkland serves 9,454, K - 12 students residing on the western edge of Edmonton, Alberta, surrounding & including the City of Spruce Grove, Town of Stony Plain and Parkland County.

The school district’s goals are focused on academic excellence for all students. Programs are designed to use assessment for learning techniques to enhance student learning. Assessment for learning is a major initiative currently being developed within the school division, and is to be incorporated until the year 2011, where then it will be looked at for further review.

Parental support and learning is also something that is highly encouraged within the school division. Parents are often encouraged to attend division in-services to learn more about current initiatives that are taking place within the school division. Currently within Alberta middle school, parents are an active part of the academic climate, and are often encouraged to take part in learning with their children, in activities known as
“student-led conferences”, where students lead their parents through some of the project based activities that they take part in within the school. Parents also are invited to informative sessions on things that may enhance or harm their students in their learning. For example, a session was offered to parents based on the dangers that their children may face while using the Internet for learning, and learned about ways that teachers and parents can work in a collaborative way with the students, to ensure the safest online environment that is possible.

As a school district, Parkland School Division believes that all students should have opportunities for success. Differentiated learning is also something that is emphasized within Parkland School Division. Many sessions are offered to better prepare teachers to help students with many different learning styles and help those students enjoy success within the school division. With these initiatives, technology integration is an important part of Parkland School Division’s current and future needs, due to the fact that it provides so many different opportunities for student learning.

Description of Work Setting

The research project will take place at Alberta middle school which is located in Spruce Grove, Alberta, Canada. At this school, the student population is approximately 550 students, and there are approximately 70 computers to serve the needs of the entire school. The staff consists of 24 full-time teachers, 8 eight educational assistants, one librarian, and two school administrators. There is one SmartBoard (interactive whiteboard) that is used for the entire school, yet it is portable and can be moved from class to class. Each grade level has its own portable projector cart and laptop, to help with any multimedia presentations that are being done within their classroom. This cart
is to be shared between the four teachers at each particular grade level. Teachers within the school and in all of the province of Alberta are expected to incorporate the Information and Communication Technology outcomes (ICT) within their core curriculum classes. These outcomes were created by Alberta Education, and help students build upon their technology skills within core curriculum classes. These objectives are also to help teachers to learn how to integrate technology into their core subject areas.

This Alberta middle school is currently in its second year of existence, and was built on the premise of using project-based learning. The school is known as a “middle school” and serves grades 5-9. It is far from a traditional school, and when it was built, the structures were made to accommodate classes joining together to work on projects together. Many of the classrooms have retractable walls dividing them, but are never usually closed. Many teachers are in a team-teaching environment, with two teachers in the classroom, and approximately 60 students in these double rooms. Many teachers in this situation will plan in their specialty areas. For example, one teacher may do all of the planning for Science and Math, while the other teacher plans for all of the Language arts and Social Studies courses. The teacher who plans for his/her subject will be considered the “lead” in that subject, while the other teacher is there for support in terms of helping with classroom management and discipline, or else to help students who may be having with certain concepts that are being taught at the time.

Another distinguishing feature of this Alberta middle school is that teachers are “looped” with students throughout years within the school. Teachers will stay with the same set of students from grades 5-7, while other teachers will stay with the same students from grades 8-9. This is believed to be serving as an important part of learning
that goes on with students at this age level. The main philosophy of the school and the administration is that it is important to build relationships with these students at this age level. Looping with the students helps not only the classes to become more comfortable with the teacher, but it also gives parents the opportunity to learn more about the teacher, and build a relationship between school and home that is more conducive to learning. If there is a circumstance where a student feels that they are not comfortable with any particular teacher, the school looks at moving the student with a different classroom. This is looked at and assessed on a yearly basis.

Writer’s Role

The role of the writer in this project is as the Technology Integration Coordinator of an Alberta middle school. This is the first year that this position has existed at this school and is part of a pilot process for the school division. The writer has several responsibilities within this position such as working with different grade levels to integrate technology into the core curriculum classes. For this position, the writer works with students and the teacher creating projects integrating technology into all subject areas. The writer is also responsible for scheduling computer use for the different grade levels, while also helping to maintain equipment.

The writer also has roles outside of the classroom. The writer acts as liaison between the school administration and division administration to help show ways that technology can be integrated into the classroom. In this role, the writer consults with the technology services office to help decide which software and hardware is valuable to the classroom, and if new technology is of value for technology integration, as opposed to simply being used for the technology alone.
Not only does the writer work with other teachers within the school on helping to develop technology integration skills, but the writer also works with students to help develop technology skills. Other than teaching math to a small group of students, the writer also teaches all technology courses within the school, working on computer skills with students. These courses are taught to students from grade 7-9, but are taught only to a small group of students within these grades. These students then act as leaders in technology skills within their classrooms, and help other students work on technology integration projects within the classroom. These trained students are also important to their homeroom teachers, as they lead their peer groups in project based activities, but also work with teachers to show them skills using technology. Having these students available within the classroom, and using them effectively, is an essential component to the overall success of the technology integration program within this Alberta middle school.

Chapter II: Study of the Problem

Problem Description

Within this Alberta middle school, students do not have adequate use of technology within the school, and teachers are not effectively able to integrate technology into the classroom. Teachers do not have any formal training of how to integrate technology in the classroom yet are asked to still do this effectively. Often times when dealing with educational technology, teachers have a new technology “dumped” into their classroom, with no formal training on how to even use the new technology, let alone, integrate it into a regular classroom setting.
Another significant issue in the classroom is the amount of technology that is available to each teacher. Since the school is limited to only 70 computers for over 540 students and staff, it is hard to get access within the school. Due to this factor, teachers have even a harder time having the available time to learn any new technology that has the ability to be integrated into the classroom, and learning how to implement the ICT outcomes into the classroom. It is important that a plan is implemented for this school where technology can be used by all classrooms consistently and on a regular basis by teachers.

Many times when dealing with technology integration, attitudes can vary greatly depending upon prior experience. It is important that within this Alberta middle school, skills are not only improved within the classroom, at both the student and teacher level, but it is imperative that attitudes are improved towards technology within the classroom. According to Goodard (2002), it is normal for teachers to experience discontent towards new programs that are implemented within the classroom, as it is part of the human dynamic. Goodard (2002) also stresses that it is only through the changing of attitudes and knowledge, that teachers will embrace new technology within the classroom. The Technology Integration Coordinator within the school must not only focus on implementing a successful technology integration plan within the school, but also improving teacher attitudes towards the use of technology within the classroom.

Problem Documentation

Teachers report that they do not have proper access to technology in the classroom, and that they also do not have the time to gain knowledge on how to integrate technology into their core curriculum classes. When discussing with
administration problems relating to the integration of technology into the classroom, they report that the technology that the school currently has, needs to be used more often, and also in a way where technology is used to enhance classroom instruction. The administration of this Alberta middle school believes that the school must move away from having separate computer classes, and take the opportunity to have students learn to use technology while they are in their core curriculum classes. Many teachers though have become so frustrated with the integration of technology, they believe that moving the school backwards towards a typing program, is the best solution for these problems. They believe that students and teachers do not have sufficient access to technology, and that it would be significantly easier to have programs that work on computer skills only, as opposed to interrupting core curriculum classes with sparse computer use. Brinkerhoff (2006) discusses how many teachers believe that technology is something that should be taught as a separate subject from the core curriculum, and that belief is perpetuated by some within this Alberta middle school.

Teachers have reported that they are very interested in learning how to use technology to enhance classroom instruction. They do however report that they are unsure of any projects that they could use that would both incorporate technology into the classroom and meet curriculum objectives. Teachers report that searching through Internet websites looking for projects is a long and arduous task, and many times when they find something of value, it is not conducive to the environment to the learning objectives of their classroom. They also report that many of the projects would take too much time to alter to adapt to a friendlier Canadian version, as many projects that are listed on the Internet, are from American schools. Teachers feel that they do not have
the time or knowledge to change projects dramatically to accommodate their own classrooms.

Parents are also unsure of how they could help their own children learn how to effectively use technology. This Alberta middle school often provides links to Internet sites that can help clarify curriculum objectives in different ways, but many parents are unsure of how to use these at home. Parents complain that they do not have the understanding of what their children are doing at home in terms of computer usage, and do not have the knowledge to help them, or even know where to begin. Parents’ report that they would like to become more involved within computer education programs within the school, but they are unable to because of a lack of time and knowledge.

When reviewing technology schedules from the 2005-2006 school year, it shows that teachers did not make adequate use of the technology that was provided at the school. Some teachers dominated the use of the technology in the classroom, while other teachers did not use the technology at all. This unfair balance between classes causes great concern to the school, because it leads one to believe that students are also losing out on skills that they may need in certain classes. Teachers have complained that they would like to do more technology integration projects within the school year, but do not have the consistent use of computer time within the school so that they are able to maintain student interest in these projects. Many times projects are started in classrooms, but their momentum is not maintained because teachers are unable to use computers other than sparse moments during a school week. Teachers move through the curriculum, and have the choice of either teaching concepts from old
units or continuing on with projects where students eventually lose interest over a long period of time.

This Alberta middle school also has one SmartBoard, but teachers within the school rarely used it at all in the prior school year. Teachers stated that this technology had great potential, but they were unsure of how to use it. When the SmartBoard was brought to this Alberta middle school in the 2005-2006 school year, there was no one available to educate teachers on how to properly use it. Some teachers did report to using the SmartBoard within their classroom on occasion, but simply as a screen to project the computer upon. The SmartBoard was definitely not used to its full capacity in its first year at this Alberta middle school.

Literature Review

Why use technology integration?

While more technology is being placed in schools, it is vital that there are teachers who are knowledgeable in the area of technology integration. (Grove, Stragler, & Odell, 2004) According to research, many teachers have computers that are available to them within their own classroom, yet they do not use that technology effectively. (Grove et al, 2004) Preparing teachers to successfully use technology in the classroom is important to get the most out of the power that technology has to offer, and it is important that teachers are prepared and properly educated in the area of technology integration. (Grove et al, 2004) Given that there is an increased availability of technology within schools, it is critical that teachers are properly educated to make the best use of this technology.
According to Christensen (2002), technology integration has a positive impact on both student and teacher attitudes, and helps to alleviate anxiety when using computers within the classroom. Christensen (2002) reports that incorporating technology into the classroom, is one of the most significant practices in the field of educational technology and is vital to classroom success. This practice is dependent upon teachers’ attitudes towards technology, which are imperative in transferring these positive attitudes to students within the classroom. Christensen (2002) discusses how teachers that have been educated in the area of technology integration, have students that receive higher scores in math than students of teachers that have not had the same training.

Assessing available technology

According to Strickland (2003), technology integration within a school should be assessed before plans are implemented to evaluate where teachers are at with their ability to successfully integrate technology into the regular classroom. This is an essential step for developing a successful technology integration plan within a school. Murphy et al (2005) believe that if meaningful technology integration is to happen within an educational setting, there has to be a restructuring of how teachers are prepared to be successful with this endeavor, and how classrooms are looked at currently.

The problems that surround technology integration within the classroom continue to thwart its success. (Stager, 2006) The obstacles that frustrate teachers are not only with the use of technology and its mechanical failure, but also lie in the lack of knowledge of how to effectively use technology, and then how to eventually effectively use technology to help with integration. Before a technology integration plan can be implemented, schools must first look at and assess what equipment and software they
have currently at their disposal, and how to make best use of this technology. (Goral, 2001)

Moore (1999) discusses how schools need to be prepared to make radical changes in order to take down any roadblocks that impede the use of technology within the school, based on the physical set-up of any particular school. Plans need to be made within schools on how to best fit technology within the school confines, and be able to use this set-up for technology integration. It is important that schools develop technology plans to decide how they will successfully use technology within their classroom. (Keller, 2000) Schools need to be creative and flexible with these plans in order to save money and not disassembling entire building structures.

Schools that do not have the budget to change entire classrooms can adapt by using laptop carts for mobile access to technology in the classroom. This is a cost effective way to bring technology integration right into the classroom, while also making use of existing space. (Grant, Ross, Weiping, Potter, 2005) According to Smith and Frink (2002), this is a very convenient and simple way for students to have access to technology within the classroom, without the inconvenience of stopping class, and having them go down to a computer lab. It also gives students the feeling that they are integrating technology within their regular classroom, as opposed to going to the computer lab to do a "computer project". A major drawback of this solution is battery life in the classroom, as laptops would not be able to go a full day in the classroom, and power outlets would not be available within a room for an entire laptop cart, which usually carries approximately 15-20 carts. (Frink, Smith, 2002) Frink and Smith (2002) also discuss how it is imperative to have wireless technology within the confines of a
school so students are able to access network files and have Internet access wherever they are in the school so that teachers are able to effectively use all the tools that a desktop computer would have to offer. Grant et al (2005) believe that having the technology come to the class through the use of laptop carts, does not only increase the use of technology within the classroom, but also provides more opportunities for teachers to learn about technology integration within the classroom.

Identifying obstacles to technology integration

Moving a school towards a successful technology integration program is not an easy task. New technology within a school can create an enormous challenge to teachers and schools due to the fact that there are many changes that are needed within a school. (Kiridis, Drossos, & Tsakiridou, 2006) According to Kiridis et al (2006), the main shift that needs to take place is in the attitudes and beliefs of teachers within the school towards technology integration. Many teachers may be able to cope with the changes that a technology integration program brings to a school, but some are more reluctant of its implementation. Factors that may impede positive attitudes towards technology integration may include, but are not limited to, a lack of experience in technology integration, an absence of suitable technology within a school, career stage, gender, past negative experiences using technology, and unsuitable or complicated software within a school. (Kiridis et al, 2006) Kiridis et al (2006) believe that these negative practices and attitudes can sometimes lead to the cancellation of technology integration programs within a school.

Brinkerhoff (2006) believes that there are four main obstacles that hinder the effectiveness of a technology integration plan. These factors can include a lack of
resources within a school, policies at the division and administration level that hinder the integration of a successful program, the lack of skills involving technology use, and attitude barriers towards the use of technology within the classroom. Brinkerhoff (2006) goes on to state that resources are a major barrier in technology integration program, but if teachers identify themselves as having weak skills using technology, they are far less likely to incorporate this knowledge into their existing core curriculum. Christensen (2002) identified computer anxiety as a major barricade to successful technology integration within the classroom. A teacher’s attitude toward technology will directly affect the quality of the students’ experiences with computers within the classroom. (Christensen, 2002)

Connecting students outside of the classroom through technology

Technology integration is a very important aspect of schooling because it gives teachers the opportunity to connect students outside of the classroom. When students are connected outside of the traditional classroom, it is a great opportunity for teachers to also collaborate with parents and help to bring them into the educational process and create a true collaborative learning environment that is beneficial to students. (Dyrli, Kinnaman, 1994) When parents have the opportunity to become involved in the learning process, students will become more engaged in what they are learning. Faucette (2000) believes that a home environment that encourages learning is essential to building important academic skills. Faucette (2000) also believes that it is very important for parents to become involved within the school’s education and school community to enhance learning. By having more parental involvement, schools benefit with a higher teacher morale, a stronger belief in their abilities by parents, higher
support from families, increased student achievement, and a better reputation in the community. (Faucette, 2000) Through the use of technology integration, teachers have an increased ability to have students involved within their child’s academic program.

One way parents can be connected to what is going on in the classroom is through the use of a classroom blogs. Having teachers create their own classroom blog helps them to work on technology skills, and can create a link between parents and the school. Through a blog, teachers do not only have the ability to send information home of what is going on within the classroom, but it also can open up a dialogue between teachers, parents, along with students. (Dunnewind, 2006) Teachers using this technology are also available to share links to sites that they may find helpful to enhance student learning, and share them with students and parents to use them together.

*Educating teachers in the area of technology integration*

According to Grove et al (2004), teachers that have had the opportunity to use technology within their own university courses, are more likely to use technology integration within their own classrooms. Grove et al (2004) also discuss how many pre-service teachers are not given ample opportunity to use technology within their cooperating teachers’ classroom, due to the fact that many teachers are not able to guide new teachers in the area of technology integration. According to a study done by Grove et al (2004), less than half of pre-service teachers had the opportunity to use technology integration within the classroom. Many post-secondary institutions had problems situating new teachers in classrooms with veteran teachers that had
experience using technology in the classroom for integration purposes (Grove et al, 2004).

Although more and more teachers want to learn more about technology integration within the classroom, it is essential that administrators support this new learning, and provide patience and support within this relatively new field. (Dawson, Rakes, 2003) The principal is the main catalyst in the endeavor of technology integration, and therefore training in technology integration for both teachers and administrators should be a priority for the school. (Dawson, Rakes, 2003) Even with an abundance of teacher training and education in the area of technology integration, any efforts are most likely to not be successful without the full support and leadership of the administration within a school. (Dawson, Rakes, 2003) Principals should take part in staff development within the field of technology integration, as it is tough to support an initiative where there is a lack of knowledge. (Dawson, Rakes, 2003)

When working with technology integration, teachers do not have many opportunities to work outside of their classroom with others that already have experience integrating technology within the classroom. According to D’Orio (2003), it is important for opportunities to be created for teachers to learn from others on staff how to better use technology in the classroom, starting with technology integration basics. Basics skills may be working with teachers to help students do research effectively using the Internet by giving basic sites for research (Wikipedia, Google), using the network to share and store files for both students and teachers, and developing simple activities that enhance learning, amongst others. D’Orio (2003) discusses a program where teachers attend a technology academy within their own school, where they are
expected to attend 36 hours of training within a year, within field of technology integration. These hours are done outside of school time, and the teachers are expected to use an additional ten hours of their own time to help mentor other teachers. A program such as this, has a major impact within a school, because it has teachers work together to learn technology skills, while saving the school money by not bringing in experts or sending staff members to professional development outside of the school division. Saving money is always a major consideration for school divisions when working with technology integration plans.

D’Orio (2003) also discusses the importance of a technology integration plan within a school for teachers to follow up on their learning. Having experts or teams within a school, gives teachers the opportunities to continuously build upon their skills and not have to wait for feedback from someone who is not available to them in a short time frame. Within this program discussed by D’Orio (2003), teachers quickly began having their own websites, and began having their marks online for students and parents to access, creating a more collaborative environment between parents, teachers, and students, and also having assessment for learning opportunities.

D’Orio (2003) believed that implementing programs within a school where teachers work with each other to learn how to integrate technology creates opportunities where all teachers have the opportunities to become stronger with technology integration skills, including those who did not grow up with much of the technology that is used in schools today. Often times, new teachers to the profession that come into a school, are usually familiar with how to use technology. This gives them the advantage of finding new and interesting ways to integrate technology within the classroom and often creates
classrooms that are not level in their usage of technology integration. By having teachers working together, this creates more opportunities for not only teachers, but all students to use technology within the classroom. (D’Orio, 2003) Using younger teachers with strong technology skills, and having them work with older teachers that may lack some of these skills, creates a stronger technology integration program within a school. (Anderson, 2005) Developing a “technology team” within your own staff is a great way for all teachers to learn about the benefits of technology integration within the classroom, and helps to build a collaborative environment within a school. (Anderson, 2003)

Having a Technology Integration Coordinator on staff is an important part of helping to develop technology integration skills on a staff. (Guttman, 2001) Guttman (2001) discusses an effective program where students and teachers work together doing a similar program that mirrors each other. When programs such as these occur within a school, teachers are trained within the classroom, doing meaningful activities with students. These opportunities not only help teachers develop their technology integration skills, but also show them how engaged students become while using technology to enhance their learning. What is essential when doing these type of mirroring activities with teachers and students, is the availability of the technology integration coordinator with the classroom, or at least the school, to help with any problems that may occur during lessons, or to answer any questions that may help further learning in the field of technology integration.

*Importance of technology integration*
Whereas technology was once seen as a separate subject within a school system, that notion is now being replaced with the belief that technology is an essential component of a school’s ability to effectively enhance curriculum. (Kiridis et al, 2006) Technology integration has for many schools become not only a major component of teacher support within the classroom, but it has also become an essential element of the school curriculum, and is an accommodating component of the classroom that helps students to develop other skills within their learning. (Kiridis et al, 2006) Kiridis et al (2006) believe that although technology integration is continuously being perceived as an important component of the education within a school, the technology is not being used to its full capabilities.

Causative Analysis

There are a number of causes that lead to problems that deal with effectively having teachers integrate technology into the classroom. First and foremost, teachers do not have either enough technology within the school, or have enough access to technology within their own classroom. This can depend a great deal upon the beliefs of administration within Parkland School Division, as principals within this school district decide where money is to be allocated within their own schools. Schools must look at the current equipment and decide whether it is outdated, and if new technology is needed for the school. New equipment is often quite expensive, and needs to be replaced in short time frames. New software is also a problem within Parkland School Division, as it is not brought in on a “just-in-time” foundation, and must be tested upon a network to see if it will work properly. This even applies to software that is available for free use; teachers do not have the authority within Parkland School Division to
download software on to computers, and must use any new software on home computers, and try to learn ways on their own to effectively use it as a way of enhancing the curriculum.

Another major problem within this Alberta middle school is the perception that technology is not always reliable within the school. Many times when teachers are using computers within the classroom, they believe that something is not working properly, or are unsure of how to effectively run the technology within their classroom. The time used by teachers during classroom instruction time to set up technology, and deal with any emergent issues, often frustrates teachers, and many times leads them to not want to use the technology in the class, and leads them to teach using traditional methods only.

When a new technology is introduced to the school, teachers are not provided with adequate education to learn how to use either computer software or hardware. Classroom teachers are often not provided with the education that is necessary to help them not only integrate the new technology within the classroom, but even to use the technology in the beginning. For example, many times teachers have seen wonderful presentations of SmartBoards being used within the classroom, and are very excited by the notion of using this technology within their own classroom. A school may then decide, because of teacher demand that parts of their budget will go to buying these interactive whiteboards for their schools. They are then purchased and left in a school with no one knowing how to properly use them. They often are used as projector screens only, as opposed to interactive boards that can effectively use manipulatives on the screen, due to a lack of knowledge on how to effectively use this technology.
Classroom teachers do not want to use this, or other technology, until they feel comfortable understanding how to use it in an effective manner within the classroom. Teachers are not provided with the necessary support or an adequate amount of time so that they can learn new technologies.

Another major barrier to effective technology integration within this Alberta middle school is that support is not available at the division level for helping teachers learn how to properly integrate technology within the classroom. Classroom teachers need the support of the division to help integrate technology, but currently there is no program available or division leader in the area of technology integration. In-servicing is expensive due to the fact that professionals are often brought in from far areas, to teach others how to effectively integrate technology into the classroom, leading school divisions to not want to spend parts of their budget on this area. A Technology Integration Coordinator is also not available at the division level, which often leads to computer technicians making the decisions on which technologies should be used within schools. Although computer technicians are very knowledgeable on how to use technology, they are not trained in the area of education, or the area of technology integration, yet they still have control of what is used in the school in the terms of educational software. These problems have limited the integration of technology within the school division.

**Chapter III: Outcomes and Evaluation**

**Goals and Expectations**

The goal is that teachers will be given adequate access to use technology within the school setting and will be also given the opportunity to receive both formal and
informal education on how to properly integrate technology into their core curriculum classes. Through collaboration between a Technology Integration Coordinator, technology team, parents, and core classroom teachers, the school will more effectively use technology to enhance learning within this Alberta middle school.

Expected Outcomes

Within this study, there are several specific outcomes that will be achieved by teachers within this Alberta middle school. It is important that the majority of teachers (90%) within this Alberta middle school are comfortable using new technology within the classroom. As an objective for the school, it is also important that 90% of teachers within this Alberta middle school are comfortable using the SmartBoard to help integrate technology within their classroom curriculum. Finally, it is expected that 90% of teachers within this middle school will be comfortable creating their own technology integration projects that focus mostly on curriculum objectives, but also integrate some of Alberta Education’s Information and Communication Technology (ICT) outcomes.

Student outcomes are also an important part of this study. It is imperative that student understanding of core curriculum courses improves during this study and will be looked at as the study goes on. Surveys and quizzes will be used to identify if students have a positive attitude towards technology integration. It is expected that 90% of students will have positive attitudes towards technology integration projects.

Measurement of Outcomes

To properly measure the outcomes of this research, several methods will be used. Pre and post-surveys will be given and reviewed to see if there is an increased knowledge of how to properly integrate technology into the classroom, and to measure
teachers gained knowledge on use of the SmartBoard. Teachers will be able to self-assess their knowledge within these areas. Pre- and post-surveys will also be given to record if teachers attitude towards technology integration have increased during the period of study. A survey on technology use, found in Appendix A, will help the writer determine how much technology is used within the school currently, along with helping to determine whether teachers feel comfortable using technology within the classroom.

Pre and posttests are essential to see if learning has increased in this study, but it is also important for the learner to be able to decipher if their skills have increased throughout the study. According to Topper (2004), teachers must become confident and competent in using technology in the classroom, and these areas can be measured through self-assessment throughout their learning. Through this study, teachers will be given self-assessment surveys to help them properly assess their own skills using technology and also to help them interpret if their skills for successfully integrating technology within the classroom have increased as the study has progressed.

What is most important when doing educational research, is learning the benefits new programs have on student learning. To look at this, student grades will be compared from last year in a project where technology integration was not used, to a project where technology integration was used in the current year. It is important to assess whether student learning has increased as a class using technology integration. It is believed that technology integration will help students learn due to the fact that, when used correctly, technology integration reaches different learning styles of students.
Although quantitative research is important to show improvement in skills within this study, it is important that we look at the attitudes of those teachers that take part in this study. It is essential to learn if attitudes towards technology integration have changed during this research. Brinkerhoff (2006) discusses how many teachers believed that technology integration is something that should be taught as a separate subject, and do not understand the importance of implanting technology outcomes into the core curriculum. Brinkerhoff (2006) also looks at the attitudes of teachers after they took a course to help improve their technology integration skills. He came to see that participants believed that their skills increased as a result of the education, and that there were also now more apt to use technology within their courses. Within this study, teachers will be given pre and post-surveys to see if their attitudes are becoming more positive towards the use of technology integration, while also looking at if they believe that it has a major impact upon student learning.

Analysis of Results

In analyzing the results of this research, it is important that teacher self-assessment is looked at within this action plan. It will be imperative to see if teachers believe that their skills have increased within the implementation of this plan. It is important to compare how many teachers believe they have improved during this research, and how many teachers believe that their skills have not improved at all. This research will be looked at through the use of surveys and qualitative data.

Within technology integration, it is important that the researcher looks at the attitudes of teachers. As discussed previously, Goodard (2002) discusses how many teachers are reluctant to change and their human nature leads them to question new
techniques that are brought into education. This is apparent within this Alberta middle school. It is important that educators look at how attitudes have changed towards technology integration during this process through qualitative means such as surveys.

Chapter IV: Solution Strategy

Statement of Problem

The problem is that teachers within a middle school are not given adequate training to use new technology that is provided for education within a regular classroom. Technology use in education is essential to develop higher-level thinking and is an important aspect of learning within the education system. Not only does technology use increase the understanding of core subjects within education, but it also is vital to developing skills for students to further in their futures. It is imperative that teachers are taught and supported in the learning of these skills so that this knowledge can be transferred to the students.

Discussion

A number of solutions for this problem have been garnered from the literature. First of all, teachers must take advantage of software and sites that are already available, instead of trying to find new software and technology and learn them from the early stages. (Stager, 2006) It is important that teachers do not expend energy and resources on creating software and sites that already exist, and focus on how to use the existing technology properly. For example, a teacher may take a significant amount of time creating a site that students can use to create their own web logs (blogs), but there are a large number of sites that would provide this same service for free. Teachers
need to take advantage of these sites, and focus their energy on learning how to use existing technology, as opposed to learning how to create this same technology.

Within this Alberta middle school, it is important to develop a technology integration plan that can be readily used in the current time. (Keller, 2000) It is essential that a plan is created and used throughout the school year, but it is also important that this plan can be changed and adapted to best serve the needs of teachers and students within the school. This plan needs to best serve the needs of all teachers and classrooms within the Alberta middle school. Currently, teachers within this school are using technology integration to help enhance their core curriculum classes, but they are in the minority. It is essential that a balance is created so all teachers have the same opportunities to use the technology within the school as to create fair opportunities for all students within the school.

It is essential that this school develops a plan to best utilize the small amount of technology that is available within the school. (Moore, 1999) It is important to assess what technology is available within the school, and from that point, create a plan that shows how to best use the technology that is currently available. (Goral, 2001) Schools also need to be able to retrofit their facilities to help progress the use of technology into the classroom, as to best serve the needs of the school, and make the best use of the technology in the school. (Dyrli, Kinnaman, 1994) Based upon this literature, the school has decided that classes will be able to use the technology available for technology integrated projects within four day periods. During this time, the classroom teachers that have the technology for this period may use it as much as they need it within the school. With this plan, students will be able to use technology for
a good portion of time and will not have to be re-taught technology objectives, while also having the opportunity to start and complete a technology integration project.

According to D’Orio (2003), teachers are more likely to learn from teachers that are available within their own school, which also is of a much lower cost than bringing in professionals from outside sources. Anderson (2003) believes that it is a good practice to use teachers that have had more use of technology, both formally and informally, and this can be used to help teachers that have not had the opportunities to use technology as much, within the school setting. Through this, a Technology Integration Coordinator will be used to work with teachers to help them learn to use new technology and help them use it effectively to enhance the curriculum. An on-site Technology Integration Coordinator should be used to help with the technology integration that is taking place in different classes within the school. (Guttman, 2001) The person in this role must not only lead teachers to help them learn about technology integration within the classroom, but must also be there to support them in their current endeavors using technology to enhance instruction.

Technology teams should also be developed to help teachers with different aspects of technology that are needed within the school, such as inputting marks into an online database, website development, and classroom technology integration projects. It is important to develop these teams amongst people with existing technology skills to help develop the overall development of technology integration skills, and help to implement a technology plan within the school setting. (Anderson, 2003) As the year progresses, more teachers should become comfortable using technology within the classroom and will have the opportunity to contribute to this technology team. As the
group becomes larger, teachers will have the opportunity to share successful practices they have used within their own classrooms, giving everyone within a school the ability to learn and grow together while developing and creating more opportunities for teachers.

According to Faucette (2000), parents need to also be involved in technology education programs as they have the ability to help develop student skills with technology at home. Working in a collaborative environment through school blogs where parents can comment and be aware of what is going on in the classroom, are very useful for creating connections between the home and school. Using schools blogs not only helps teachers to learn how to effectively use technology, but it also opens the classroom up to the parents, and lets them comment on the work that is being done, and is more than just a way of delivering a message. (Dunnewind, 2006) Teachers can also post questions to students on their blogs and elicit higher level learning that parents are able to see within the confines of their own home. (Dunnewind, 2006). Another successful practice within schools is providing parents with website links that help to further knowledge on different subject areas. Providing these links helps to further the knowledge of students with work at home, and also helps parents to become more involved within their child’s education.

Description of Selected Solutions

There are several approaches that are to be undertaken to help with teachers’ knowledge of technology integration within this Alberta middle school that can be realistically implemented within the current school year. First and foremost, teachers will have the opportunity to work with a Technology Integration Coordinator at the
school level, to help them learn how to best integrate technology within their own classrooms. The Technology Integration Coordinator of the school will be working with teachers both inside and outside of their classrooms, to help them best learn how to effectively use technology to enhance learning. Through this method, the Technology Integration Coordinator can help the teachers to both learn how to create projects and lessons for classroom use, but also to help teachers learn how to teach lessons within their classroom using technology. This will help to alleviate apprehension of failing technology in the classroom, and will provide for extra support as there will be another teacher present within the classroom.

The Technology Integration Coordinator will not only be able to work with teachers in the classroom, but will also lead the staff in short professional development opportunities provided after school. These opportunities will be based on school needs and teacher interest, and will be supplemented with extra support within the school, and also a presence upon the Internet, in the form of directions being provided on how to use certain technology that teachers can access from both within school and from home. Through this process, teachers can learn at a rate they are comfortable with, but will always have the Technology Integration Coordinator within their own school to answer any questions, and help to further their own learning.

Within this Alberta middle school, a technology integration team will be developed to work in conjunction with the Technology Integration Coordinator. This team will work with other teachers to help them with certain aspects of technology integration that the team is comfortable with, or else help find answers for teachers through either research, or consulting the Technology Integration Coordinator.
Technology team members will also have the opportunity to share technology integration projects that they have done in their own classrooms with staff, through small professional development sessions, or through the use of online tutorials.

A technology team will also be developed at the division level. Through this initiative, teachers that have already effectively integrated technology within the curriculum will have the opportunity to share their success with other teachers within Parkland School Division. Not only will they have the opportunity to share their success, they will also have the prospect of helping teachers develop their own projects based on the needs of specific curriculum objectives. These projects will definitely use technology to enhance learning, but will be built within a collaborative environment. This technology team will also have the opportunity to consult with the division technology team to help evaluate technology that can be used within the classroom, and help to serve the needs of teachers within the division, and provide opportunities for just-in-time learning.

Working within this Alberta middle school, certain areas will be focused on to help with the creation of a successful technology integration program. Teachers within this Alberta middle school will be given opportunities to learn how to effectively use the SmartBoard for classroom technology integration in the form of classroom in-service, and short professional development opportunities offered after school. Teachers will also learn within this Alberta middle school, how to effectively navigate Parkland School Division’s network system. This is something that is essential to the learning of this school, as information will be stored within this system to help further both teacher and student learning. Any technology integration projects that are developed with teachers
will be stored within this network that will include all the necessary templates and information needed to complete these projects. Teachers will not only be able to use these projects within their own classroom, but will also have the opportunity to adjust them to their own teaching style, and adapt them to the needs of their own classroom. This will also create a collaborative environment where teachers can work with one another to see which projects were successful, and discuss the positive aspects of the projects, and in which areas they need to be improved.

Within this school, the Technology Integration Coordinator will work with teachers to develop projects in different subject areas within classes in this Alberta middle school. The Technology Integration Coordinator will be the lead teacher in the classroom, and gain support from the regular classroom teacher, on how to best hit the curriculum objectives for the projects. The Technology Integration Coordinator and classroom teacher will work together to create these projects, but the classroom teacher will have the opportunity to use this time as an informal in-servicing. The classroom teacher will have the opportunity to see how to effectively integrate technology into the classroom teacher, and will have the ability to take the lead within the class utilizing technology, when they feel comfortable. Classroom teachers will also have the opportunity to adjust assignments to modify it for their own particular classroom. The Technology Integration Coordinator will create the project based on the curriculum objectives provided by the classroom teacher, to ensure that the teacher is not short on time for other areas of his/her position.

An effective way to help with the integration of technology within this Alberta middle school is to involve parents within the classroom. A school website will be
created and updated regularly to help create a link between the school and home, and it will offer valuable links to help enhance student learning, and will also offer tutorials and presentations that can be used at home to help parents with their own learning of what their child is learning at school. Through this endeavor, the classroom teachers will provide links to websites that help enhance learning, and help to reach students with different learning styles. These websites can be used by parents to help with their child’s learning, and is a great way for parent and child to collaborate at home, and for the parent to become more involved within their own child’s education.

Parents will also be invited to school presentations based on the different aspects of technology, including technology that is used within the school, and technology that may be used by students that are not used for school purposes. Parents will have the opportunity to further their understanding of the technology integration program taking place within this Alberta middle school, and have the opportunity to do both formal and informal learning on how to use different aspects of Microsoft Office, how to create their own web log, how to effectively search the Internet, and opportunities to learn about others, based on parent interest. Parents will also have the opportunity to learn about some of the obstacles that their child may face on the Internet, and learn how to be better equipped on how to deal with dangers that may be on the Internet, such as online predators, and identity thieves. These sessions will be presented to parents by the Technology Integration Coordinator, and will be ongoing throughout the school year. The Technology Integration Coordinator will also be available to these parents throughout the year to help them with any questions that they
have on either the technology integration program offered within the school, or else on any concerns that they may have with technology.

Classroom teachers will also have the opportunity to create a classroom blog. Through this opportunity, parents will have the ability to learn about what is going on within their own child’s classroom while also having the opportunity to open conversation with the teacher about classroom activities. Through this classroom blog, teachers are also able to show the furthering of their technology integration knowledge through the providing of links to websites that enhance the curriculum, and by also discussing what is currently going on within their own classroom, or else conferring about technology integration projects that may be in the future. Parents can also look at these technology integration assignments, as they are to be posted upon the Alberta middle schools website, in combination with the technology integration program.

Calendar plan for selected solutions

Included below was a plan that was implemented within an Alberta middle school during the 2006-2007 school year.

Academic Year 2006

Month One, Week One

Within the first week of implementing a technology integration plan within a school, it was imperative that teachers first looked at the resources that were available within a school. Parkland School Division has decided that it will no longer integrate any new technology initiatives within the school division, as it is too far behind implementing its current initiatives. According to Strickland (2003), it is very important that the resources available and the knowledge of technology integration is assessed
before starting any new technology integration plan. During this first week, it was important to find out the number of hardware resources that were available within the school. It was necessary to take into account the number of both desktop and portable laptop computers, and also look at the wireless Internet access that was available within the school as well. This was something that was essential for this technology integration plan to work well. It was important to learn of the limitations that were within classrooms and schools, and to also learn of how school and classroom dynamics should work. For example, if there were only 30 laptop computers available for a class of 60 students, it was essential that the majority of projects that the school works with during this study are done in either partners or groups. This ensured that all students within the classroom were involved within the project, while also learning valuable skills in technology. It was also important to look at the resources available within the school as to further avoid lessons that could have caused disappointment to teachers, due to inefficient resources, or lack of wireless technology.

Teacher self-assessment of skills should were also discussed within this first week. Sending out surveys based on teacher use of the current resources gave the Technology Integration Coordinator the opportunity to not only assess what skills were apparent within the school, but will also helped to understand which teachers were to be vital parts of a technology integration team within the school. This team was something that was created within the first two weeks of the plan, and will be further discussed in week two of this plan. A self-assessment survey should was sent out to staff to help better understand the level of skill that may was apparent within the school, but also to help understand the overall attitude of teachers towards technology integration within
the school. Learning about skills and attitudes helped to avoid barriers that arose later on within the school year.

A technology integration plan was an important aspect of the school’s culture, but only has the opportunity to go further based on the vision of the school, and the school’s administration. The Technology Integration Coordinator ensured that the vision of the administration aligned with the vision of him or herself. To ensure this, a meeting took place in order to sort out the expectations of teachers and the Technology Integration Coordinator, within this process. Once all expectations were decided within this plan, then it was possible to begin implement a successful technology integration plan.

Month One, Week Two

After the first week of assessing the technology that is available within the school, it was important to start implementing the technology integration plan. First and foremost, a technology integration team was formed. This team was used to help with the development of technology plans, and was available for the school to help with any technology integration lessons, or even with problems that teachers may be having with technology in the classroom. It was important to look at each member’s area of expertise, and have them take roles on the team within these areas. This team was essential to the success of the school technology integration plan.

After the initial meeting, the Technology Integration Coordinator created a schedule for working with a segment of teachers within the Alberta middle school. The Technology Integration Coordinator worked within each classroom level (5-9) to lead a project using both curriculum objectives and information and communication technology outcomes. A schedule of available computer time was made available to teachers, with
the group that the Technology Integration Coordinator having priority to book available time. Any time that was available on the computer schedule, was used to finish up small existing projects, to encourage the prior use of technology integration within the classroom. For example, although grade five was working with the majority of the computer time within week three, any available computer time was made available to work with teachers to help them with any lessons that they were already teaching using technology integration outcomes.

Within week three, the grade five classroom teachers worked with the Technology Integration Coordinator to create a project based on curriculum objectives and technology integration outcomes. This project was integrated within the next week of the plan. Both the classroom teacher and the Technology Integration Coordinator worked with each other to help ensure that all objectives were met within this project, and that the students took part in an engaging project enhanced through the use of technology.

The Technology Integration Coordinator offered a short in-service to staff during week two. This in-service was provided after school, and was approximately 30 minutes in length, based on how to use the SmartBoard effectively within the classroom. This was an introductory lesson, and showed some of the features that were available when using the SmartBoard. Although this session was approximately 30 minutes in length, the Technology Integration Coordinator was available after the session to help teachers with any further questions that they had, and worked with them in a more personal setting, with this hands-on tool used for technology integration.

*Month One, Week Three*
During this week, a project was integrated into the grade five classroom, while the grade six teachers worked with the Technology Integration Coordinator to help develop a technology integration project for week four.

To have a strong technology integration plan within a school, it was important that a web presence was created to help showcase some of the student work and projects that were worked on and created within the school. Within week three, it was important to develop a web presence to create connections with parents. A newsletter was sent home with students, advertising this website, and how it could help with student achievement within the school, by providing projects for students to look at for home use, and by also providing external links to websites that are already providing valuable materials to help students enhance their learning on subject area. Through the use of email, teachers were able to send any websites that they felt were of value, and were posted under a separate link for each grade level, and subject area. This website also provided email links to teachers for parents to contact to help with any questions that they had about the technology integration plan, and to also create a link between home and the school. Connecting parents to the school and expanding their learning on what teachers are doing in school, was a major component of this project, and helped to further the knowledge of the students. Updating the website with helpful links and school information was an ongoing process throughout the entire year.

*Month One, Week Four*

During this week, a project was integrated into the grade six classroom, while the grade seven teachers worked with the Technology Integration Coordinator to help develop a technology integration project for week five.
During week four, a follow-up session on the use of the SmartBoard within the classroom, was offered. This session offered some advanced techniques on using the SmartBoard, and was offered by the Technology Integration Coordinator and the technology integration team. The technology integration team was also available during this session to help work with teachers on a one-on-one basis, so that they had more of an opportunity to learn how to use the SmartBoard. This session was important for not only furthering the knowledge of how to use the SmartBoard, but was also important for introducing the technology team to the staff and showing their importance for staff development.

Since the webpage was established, it is important to now showcase student work. With the permission of the students and the classroom teacher, students’ projects were posted on to the school website. With this knowledge, students tended to focus more on the quality of their work due to the fact that they knew it was going to be published on the Internet. Parents also took pride in the work of their children being posted on the Internet, and took more interest in the school website.

During this week, it was also important that contacts were made within the school division to have a division-wide technology team. This team was important to not only the division, but also the school, as they were able to share ideas on ever-changing technology and were able to provide different ideas and perspectives on how technology was integrated within the classroom.

*Month Two, Week Five*
During this week, a project was integrated into the grade seven classroom, while the grade eight teachers worked with the Technology Integration Coordinator to help develop a technology integration project for week six.

To create a stronger connection between school and home, a presentation was offered to parents on the “Dangers of the Internet”. This presentation was based on obstacles that may create problem for younger children on the Internet, such as social networking sites, chat rooms, web logs, amongst other things. These issues were discussed on how they can create problems with students, but how they could also be used in a valuable way in an educational setting. The researcher worked to equip parents with the knowledge on how they can best work with their children and the school to keep everyone safe and get the most out of the Internet at home. This step was crucial for developing relationships between school and home and also helped to further the knowledge of all those were involved within the technology integration plan.

During week five, the Technology Integration Coordinator of this Alberta middle school met with other technology leaders within the school division to create a division technology team. This team came together and created a plan of how to best share knowledge with teachers around Parkland School Division, through the use of networking, division email, and by having a web presence. They also created times when teachers can join together to show technology integration projects that were currently taking place within other schools.

Month Two, Week Six
During this week, a project was integrated into the grade eight classroom, while the grade nine teachers worked with the Technology Integration Coordinator to develop a technology integration project for week seven.

The school technology integration team had a major impact this week in regards to the technology integration plan. The technology team worked with different teachers and offered personal sessions on how to further use the SmartBoard. They also helped teachers develop their own lessons using software such as SmartNotebook so that the teachers gained a further knowledge on how to effectively use this technology. Through creating a lesson that was used within the classroom, teachers came to understand how to further use the technology on their own.

The technology integration team, along with the Technology Integration Coordinator, offered a session on how to create a classroom blog. Teachers were shown how to create a blog using the “edublogs” website, and how to effectively communicate with parents about success they are having in the classroom. Through this communication tool, teachers gained a better knowledge of how to effectively communicate with parents through the Internet, but also further developed their technology integration skills. All of these classroom blogs were posted on the school’s Internet site.

*Month Two, Week Seven*

During this week, a project was integrated into the grade nine classroom. After this week, all grade levels had a technology integration project incorporated into their classroom.
The division technology team met this week in a “sharing session”. During this session, they brought examples of projects that they did in the field of technology integration, and learned different projects that they could use within their own school. It was important that teachers on this team were able to add on to these projects so that they were able to effectively adjust them to fit the needs of their school and individual classrooms. These sessions were very important to the development of the school and division technology integration program, as they inspired teachers with ideas, and created valuable contacts with teachers that were already successfully integrating technology within their classrooms.

Month Two, Week Eight (Final week)

During this week, the final session on the SmartBoard was offered. In this session, teachers within the school were able to share lessons with other teachers, and showed how they effectively integrated technology within their own classroom. They also were able to share these lessons through the school network, and teachers were able to adapt them to the needs of their own classrooms. This session was not only informational, but was also an opportunity for teachers to celebrate their success in using the SmartBoard.

These teachers also now became leaders within the school and helped other teachers on how to effectively use the SmartBoard within their own classrooms, as all teachers probably would not have participated in these sessions.

During a professional development day, teachers had the opportunity to share the technology integration projects that they completed within these past eight weeks with the help of the Technology Integration Coordinator. Teachers were able to
showcase student work and also their own learning through this whole process. A discussion was led on where to go with this plan, and what projects teachers would like to see in the near future. The Technology Integration Coordinator was also available to help teachers with the next round of projects within their classrooms.

To further develop the connection the school has made with parents, this Alberta middle school had student led conferences showcasing their work in the area of technology integration. Students had the opportunity to bring parents in to see projects that they completed in the area of technology integration, and parents had the opportunity to discuss with teachers the projects that they have implemented in greater detail. This was a very successful event within this Alberta middle school.

A post-survey was given to teachers in this final week to see how the program had impacted their knowledge. It was also important to see how knowledge has increased during the implementation of this project, but it was also very important to see how teachers’ attitudes have changed during this entire process. Although there was a great deal of work that was done within these eight weeks, since it was done properly, it came with great success.

**Chapter V: Study of the Problem**

**Results**

The problem is teachers within an Alberta middle school are not given adequate training to use new technology that is provided for education, within a regular classroom. The goal is that teachers will be given adequate access to use technology within the school setting and will be also given the opportunity to receive both formal
and informal education on how to properly integrate technology into their core curriculum classes.

Within this project, 90% of teachers within an Alberta middle school were expected to become comfortable using new technology within the classroom. 90% of teachers within this school were also expected to be comfortable using the SmartBoard to help integrate technology within their classroom curriculum. It was also expected that 90% of teachers within the middle school are now comfortable creating their own integration projects that focus mainly on curriculum objectives, but also have incorporated Alberta Education’s Information and Communication Technology (ICT) outcomes. Student outcomes were also an important part of this study. It is imperative that student understanding of core curriculum courses improves during this study and their attitudes towards technology within the classroom have also improved.

During this study, 90% of teachers within an Alberta middle school were expected to become comfortable using new technology in the classroom. This objective was met within this study. 100% of the teachers showed an increased ability of working with technology in the classroom and were successful implementing it at some level into their core curriculum. Teachers reported that they felt that they had an increased confidence in their own ability not only using technology within their core curriculum, but also developing their own projects using some forms of technology. Although teachers were all at different levels within the study, they all felt that they had an increase in their own ability. Many also discussed that they would like to continue on with their own professional development within this area so that they can continue with their growth.
90% of teachers were expected to feel comfortable using the SmartBoard within the classroom. This objective was not met within this study. Only 50% of teachers even had the opportunity to use the SmartBoard within the classroom as funds were decreased in the area of technology and another SmartBoard was not purchased for the school. Many of the teachers that did have a chance at using the SmartBoard though were disappointed that they did not have more opportunities to use it in their classroom on a more regular basis.

90% of teachers were also expected to be able to create their own integration projects. This objective was met within this study. Although several teachers still had worked with the Technology Integration Coordinator to help develop these projects, the ideas were theirs. Support was provided for them, which is likely to be available in the future, in the form of a school or division level Technology Integration Coordinator, to help them ensure that they have the proper software available, and to help them with questions on any components that they are unsure of within these new projects.

Student attitudes towards technology were also expected to improve within this study. This objective was met within this study. Within a sample of students’ surveys from grades 5-9, many reported that they had felt more engaged in classroom activities and that they enjoyed the projects that were now being done within the classroom. Although their attitudes towards technology had increased, there was also an increased perception that more technology needed to be available within the classroom.

Discussion

Over the implementation of this plan, the results were very successful. Teacher knowledge and attitudes toward technology greatly improved, while student success in
the classroom also increased. In personal discussions with teachers, they also reported that student engagement in class while doing technology integration projects had increased significantly. They felt that students were on task a higher portion of the time, and were quite proud of their own accomplishments in the classroom during this process. Although there were several areas where this project had seen some great success, there were also a few areas where improvement could have been made.

Integrating the SmartBoard into the classroom saw mixed results within this Alberta middle school. Although the session that was presented during week three of the plan was quite successful, there were several obstacles to the teachers becoming successful using this technology in the classroom within the latter weeks of the plan. The major obstacle that was presented to staff in the use of this technology was availability. As there was only one portable SmartBoard that was available to the 24 teachers within the school, frequent use of this technology was not possible. Teachers reported that they became frustrated with the lack of availability of the technology and that they did not have the time to bring it from one classroom into their own and set it up without a disturbance to their own classroom. Due to these limitations with the use of this technology, teachers did not have the time to use and master this technology as was hoped by the initial plan of the project. There was a small group of teachers that used the technology frequently though during this time, and the use of the board increased a tremendous amount. From that perspective, there was some success, as this technology was not being used a significant amount prior to the session that was provided. Although the author was disappointed that a larger majority of the teachers
did not improve their learning with this technology, there were a small number of teachers that found this technology to be of great service in the classroom.

Although the objective for the SmartBoard was not met, there is an opportunity for this portion of the project to be successful. It is important when creating a successful technology integration plan within a school that the coordinator understand the amount of technology that is available to the school and what hindrances the availability of this technology may have upon the plan’s final objectives. To improve on this particular objective, the author should have lowered the objective to include only a small portion of teachers within the school, especially since only one to two of the teachers prior were using the SmartBoard within their classrooms with any consistency. It is necessary to look at the technology available within a project like this, and either set the objectives lower based on the amount of technology available, or else look for additional funding to provide for more technology to be provided within the school. This area has great opportunity within this Alberta middle school, but currently the technology is not available for a significant use by all teachers within the school on a consistent basis.

Teacher use of technology had greatly increased during the time of this project. From the beginning of the project, the Technology Integration Coordinator had teachers book out the media center, portable laptop carts, and SmartBoard from a shared network spreadsheet. Teacher usage of the media center and portable laptop carts went from 50% in the first 2 weeks, to 100% during the remainder of this study. SmartBoard use went from approximately 20% within the first 3 weeks, to approximately 75% usage during the remainder of the study, although the use was by a small portion of teachers within the school. Although computer usage does not signify successful
technology integration within the classroom, it does indicate that there is a greater chance that successful integration is taking place within the classroom.

The greatest success of this plan has been in the lessons that have been created by the teachers. Teachers felt that they had significant impact on the development of projects that were implemented within the classroom and that objectives were met. According to all of the teachers within this study, the objectives of their curriculum were met within the lesson and students were highly engaged in the learning process. The majority of teachers also indicated that they would need little support from the Technology Integration Coordinator to implement the same project in the following year, although many deemed that it is necessary that some support is provided to help with any problems that may occur with the technology, at least through the means of email communication.

Teachers gaining knowledge in the area of technology integration of the core curriculum is the most essential objective of this project. Teachers need to feel comfortable integrating technology on their own within the classroom. As their ability increases in the area of technology integration, it is important that they are able to create their own projects with the use of technology for their classroom. Technology is constantly changing and teachers need to feel comfortable to adapt to these changes. As teacher education programs progress, more and more teachers will enter schools with the ability to integrate technology successfully into their core curriculum, but currently support is needed at the school and division level to help with the success of these initiatives. Teachers within this Alberta middle school felt that learning during classroom time with the aide of the Technology Integration Coordinator was beneficial
to the learning process, while also providing them the necessary time to learn new technologies. Teachers were also appreciative of the short sessions that were offered immediately after school, instead of many long and monotonous sessions offered outside of the school. It is beneficial to have a specialist in the area of technology integration within the school because they have the ability to easily assess what technology is available for projects and what technology may be needed. Overall, the success of this program was overwhelming and shows great promise for what can be achieved within this Alberta middle school in the future.

Recommendations

1. Assess technology that is available at the beginning of the project and what may be needed. One of the biggest roadblocks for teachers in the successful integration of technology is that they are unaware of what they can and can not do. It is essential that both teachers and the Technology Integration Coordinator within the school know what hardware and software is available within the school, as it is often hard and time consuming to bring in new technologies within a school.

2. Assess where the ability is of the staff that one is currently working with and where lies there strengths, along with the areas that need improvement. It is essential that pretests and surveys are done before working with a group to understand their abilities. Technology ability can vary greatly from staff to staff, and it is necessary to bring in projects that are not too hard for many teachers, while also providing new information and technology techniques for others. Assessing ability before one works with a staff will help to ensure that progress has been made within the area of technology integration.
3. Create projects based on core curriculum objectives and then add technology, not the other way around. For learning to be meaningful to both teachers and students, it is necessary that core curriculum objectives are being met within a technology integration project.

4. Plan for any additional funding that may be needed. Although there may be many areas where necessary hardware and software are in place, technology is ever-changing and developing, and it is important that schools are able to take advantage of new technologies that emerge. Funding will definitely be needed to take advantage of these technologies, but it is imperative that school personnel understand that new technology takes time to be put in place within a school.

5. Include several stakeholders inside and outside of the school within the technology integration plan. This includes IT, division leaders, parents, administration, students, and teachers. The more stakeholders that are involved in this process, the more likely students will be successful. This also helps to ensure that these stakeholders are aware of what is taking place within the school and that support is given for new initiatives.

6. Provide opportunities within the school for teachers to learn how to successfully integrate technology into the classroom. Teachers are often bombarded with initiatives in education that take up much of their time outside of the classroom. It is essential that the Technology Integration Coordinator offers opportunities on emerging technologies that teachers are interested in, and provide just-in-time learning initiatives for teachers based on their interests. These opportunities should be offered in small segments that are easily accessed by teachers (after or prior to
school hours) and should also be no longer than an hour in length. If you offer sessions longer than this, teachers may not be interested in attending or may lose much of the information.

7. Be available to teachers before and after professional development sessions. The biggest advantage of having a Technology Integration Coordinator within a school or division is the fact that they should be available to teachers often to help them with questions on technology or with the development of projects. Being available will help to ensure that technology integration projects are being implemented within the school and that there is great success.

8. Create a team that is willing to work in the area of technology integration. There are many areas of technology, and one person can not be an expert in all areas of technology. Having a collaborative group that can work in different areas of emerging technologies can be essential to the success of a school’s technology integration program.

9. Be flexible and able to provide opportunities for just-in-time learning. Teachers will want to learn how to use new software and technology as they materialize and it is important that the Technology Integration Coordinator evaluate the use of these technologies in conjunction with implementing core curriculum objectives. If these technologies can help enhance the curriculum and engage students in the classroom, it is important that the Technology Integration Coordinator be an example of lifelong learning and help to learn these programs, teach them to others, and help integrate these programs successfully into the core curriculum.
10. Evaluate areas of success along with areas of needed improvement. For any project to be successful, it is necessary to evaluate improvement in the school amongst staff and students, along with areas that need to still be developed. Evaluation of success is crucial to this program to show its validity to all stakeholders, while also showing that a technology integration program is an important part of the overall school development.

Plans for dissemination

The author’s future plan for disseminating the results of the study is as follows. The author will present the plan to the Alberta middle school at the beginning of the school year to both school and division administration, and will also ask for suggestions and changes that may be needed to help the project to be successful within this school. After improvements are made with consideration to the school that this project will be implemented in, the author will then present the information to the staff of this Alberta middle school, to notify them of what the plan is for the current school year. The plan will be presented with a short PowerPoint that will illustrate the objectives of the plan, how it will be implemented within the school, and then how it will finally be evaluated. This PowerPoint will be short, but will be open to a short discussion from the staff members. This same PowerPoint would also be presented to parents that are interested in the program, so that they are made aware of what their children will be doing within the upcoming school year, and learn more information on how they can help to ensure success through support from home.

After this plan has been presented, pretests will be given to the current staff. This will be used to evaluate the aptitude level of the current staff in the area of technology
integration so that a program can be fitted to the needs of the current school. Once the Technology Integration Coordinator has evaluated these results, the project will begin within the Alberta middle school. The plan will be evaluated and assessed as it continues throughout the school year, and then will have a final evaluation at the end of the school year. This progress that has been made through the year by both staff and students, in both the areas of attitudes and ability, will be made available on the school website. After the results are discussed and shown to the Alberta middle school teaching staff, these results will be made available on the school website for the perusal by staff, students, parents, and both school and division level administration. The author of this plan will also hold a meeting with both school and division level administration to discuss the results and success of the program.
References


APPENDIX A

Survey on technology use

1. How many times each week do you use some sort of technology in your classroom?
   a. 0  b. 1-2  c. 3-5  d. >5

2. How many times each week do you have access to the computer lab or laptop cart?
   a. 0  b. 1-2  c. 3-5  d. >5

3. How comfortable do you feel using technology in your classroom?

4. How many times this month have you used the SmartBoard within your classroom?
   a. 0  b. 1-2  c. 3-5  d. >5

5. Do you feel that you have adequate access to technology within GCMS?
   a. Very adequate  b. Adequate  c. Not adequate  d. Do not use technology in my classroom

6. Do you feel that you have an adequate amount of time to learn new technologies that we have at GCMS?
   a. Very adequate  b. Adequate  c. Not adequate  d. Do not use technology in my classroom

7. Do you feel that there is enough support at the division level to help you integrate technology into the classroom?
   a. Great support  b. Good support  c. Some support  d. No support

8. Do you feel that there is enough support at the school level to help you integrate technology into the classroom?
   a. Great support  b. Good support  c. Some support  d. No support

9. How many technology projects have you incorporated into your classroom in the previous year?
   a. 0  b. 1-2  c. 3-5  d. >5

Additional Comments:
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
APPENDIX B

Student Survey - Technology use in the classroom
(Circle the letter of the best answer)

1. How many times each week do you use some sort of technology in your classroom?
   a. 0  b. 1-2  c. 3-5  d. >5

2. How many times each week do you have access to the computer lab or laptop cart?
   a. 0  b. 1-2  c. 3-5  d. >5

3. How comfortable do you feel using technology in your classroom?

4. How many times this month has your teacher used the SmartBoard within your classroom?
   a. 0  b. 1-2  c. 3-5  d. >5

   Do you feel that you have adequate access to technology within GCMS?
   a. Very adequate  b. Adequate  c. Not adequate  d. Do not use technology in my classroom

6. How many technology projects have you worked on in the classroom during the 2006-2007 school year?
   a. 0  b. 1-2  c. 3-5  d. >5

7. Do you enjoy the technology projects that your teacher has integrated into the classroom this year?
   a. Love them!  b. Very good  c. Average  d. Below average  e. Poor

8. Do you feel that your ability has increased in the area of technology?
   a. Greatly increased  b. Somewhat increased  c. Not increased at all

Additional Comments:

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________
APPENDIX C

Technology Integration Project Guide and Summary

Grade Level:

Subject(s):

Objectives:

Technology needed:

Plan:

Final analysis

1. Did you feel the objectives were met within this lesson? (Comments)

____________________________________________________________________
____________________________________________________________________

________________________________________________

2. Did you feel comfortable with the technology used during the lesson with the help of the Technology Integration Coordinator? (Comments)

____________________________________________________________________
____________________________________________________________________

____________________________________________________________________
3. Would you feel comfortable doing this project next year without the aide of the Technology Integration Coordinator? (Comments)
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

4. Did you find that students were engaged within this project? (Comments)
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

5. What assistance from the Technology Integration Coordinator would you feel necessary to the successful integration within your core curriculum?
   a. Full availability of TIC
   b. Half availability of TIC
   c. Little availability from TIC
   d. Email support
   e. No support needed

6. What suggestions would you make for the improvement of this particular project?
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Final Comments:
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________