TECHNOLOGY INTEGRATION IN A 3-5 CLASSROOM AND READING ACHIEVEMENT:

A REVIEW OF LITERATURE

by

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Abstract

The purpose of this review of literature was to determine if technology integration in the 3-5 classrooms relates to reaching achievement. The research focuses on several studies that implemented technology in classrooms around the country and world. These studies were analyzed to determine if the use of technology in the classroom related to reading achievement or student achievement in that certain circumstance. The studies included positive results when it came to use of technology and reading achievement.
Chapter I - Introduction

In 2003, the United States Census reported 62% of households in the United States had one or more computers with 67% of U.S. households having Internet access (http://www.census.gov/prod/2005pubs/p23-208.pdf). The National Center for Educational Statistics reports as of 2005, 93% of public school elementary classrooms in the United States had Internet access (http://nces.ed.gov/fastfacts/display.asp?id=46). The revolution of technology in our schools and homes has introduced a change in the way we perform everyday tasks and communicate. Walsh, Asha, and Sprainger (2007) suggest, “a shift in communication has many researchers contending that there needs to be a pedagogical shift so the classroom is able to incorporate these new modes of communication” (para. 6). That shift must include the way teacher and students use technology to increase learning in the classroom. Teale, Zolt, Yokota, Glasswell, and Gambell (2007) state, “literacy instruction at the higher grade levels has not been given the attention that it requires” (p. 499). With that in mind, as educators it is our job to find what resources are available that allow us to teach the best we can. If students are not reading at grade level, resources must be found to help a child become a better reader (Teale, et al, 2007). One such resource is technology.

In 1946 the first vacuum tube computer was made. Since then technology has made great advancements and, in the early years of the United States, played a major role in the cold war, putting the first U.S. man on the moon, and education (Murdock, 1994-2004). Although, schools in the United States began receiving funds for the implementation of technology in 1950’s (Coley, Cradler, Engel, 1997) it was not until 1963, when the Vocational Education Act is passed into law that secured more money for schools to implement technology. Later, in 1965, the first mainframes and minicomputers were put into schools. These were, however, mostly used by
administrators as a database for student information, and thus, not used for instruction. In 1974 the first Apple I PC was sold as a kit and a year later Apple donated Apple I PC’s to several schools. By 1979 there was approximately 15 million Apple computers in use in the United States and a few years later, in 1981, drill and practice software becomes accepted into schools and by 1984 more educational gaming software and tutorials were developed. In the early 1990’s more and more educational programs were developed for students. Video disks and CD-ROMs all with sound and moving pictures were available and students were provided with access to on-line information via a Gopher server. By the mid-1990’s technology integration in the schools was in full swing. Programs such as HyperCard, HyperStudio, and the Internet were available for student use (Murdock, 1994-2004). The U.S. Department of Education, the National Science Foundation, in more recent years, other groups have joined in the support of technology funding for U.S. schools. These groups include the Departments of Agriculture, Commerce, Defense, and Energy, also the National Endowment for the Humanities. Support from these groups has allowed the purchase of a variety of technology for schools. Such technology included hardware and software as well as educational technology centers, and technology to assist disabled learners. Much of the advancement of technology in the schools has come from the United States government when in 1994 the legislature passed the Goals 2000: Educate American Act and the Improving America’s Schools Act (IASA). These acts provided millions of dollars to states toward the implementation of technology in U.S. schools. The America’s Technology Literacy Challenge was set up to aide states in reaching their technology goals (Coley, Cradler, Engel, 1997).

The many methods of teaching reading and the controversy that surrounds best practices for teaching reading, provides a plethora of information about the history of teaching reading.
However, there are trends in which reading was and is taught. In the early years of The United States, primarily in the 1600 and 1700’s an emphasis was put on the use of phonics and syllabication to teach reading. Students often used Hornbooks or Spellers to aid in their learning. By the 1800’s students were using Readers to learn to read, this was followed by the use of the Speller. The students were often not allowed to read words they did not know how to spell. By 1844 a new trend had started to emerge with Horace Mann’s emphasis on whole word instruction. Despite its controversy the whole word method remain in schools for several years. At the same time, the debate about spelling emerged. The question of using spelling books or not and how spelling should be taught, pertaining to the spelling rules and the exceptions of those spelling rules were the issues. In the later part of the 1800’s new research was found pointing out students benefited from the instruction of phonics rather than whole word. Thus another shift in reading instruction occurred, often with phonics skills and whole word skills being intertwined. Later, in 1955, research by Rudolf Flesch, titled, “Why Jonny Can’t Read” began to spark trends to teach phonics. In the 1980’s and 1990’s the trend of whole word becomes whole language. Research done by Jeanne Chall sparks a shift toward the instruction of phonics, in 1967 and 1983 initiating even more support for the use of phonics. From Chall’s research, other finding on the basis of phonics, and the No Child Left Behind law, phonics has been the primary way of teaching reading in the United States (Brown, 2006).

**Statement of the Problem**

The purpose of this paper is to explore technology related studies and decipher if technology can benefit the teaching of reading in an elementary school classroom. This paper focuses primarily on student use and how using technology can related to the overall reading achievement of that student. The focus is on higher elementary grades because, as stated earlier,
often times those students are overlooked when it comes to reading achievement and the focus is reading of the curriculum.

**Research Question**

To what extent does the integration of technology in a 3-5 classroom impact reading achievement?

**Definition of Terms**

Technology - “computer based tools – both hardware and software, the Internet, and computer based multimedia” (Ringstaff & Kelley, 2002).

Reading Achievement -

E-books – (talking book) CD ROMs that are inserted into the computer and entail a multimedia presentation of a book, which includes speech feedback so the child may have the story read to them. An e-book also contains music and sound effects and the use of a dictionary for difficult words (Littleton, Wood & Chera, 2006; Korat & Shamir, 2007).
Chapter II - Literature Review

Hopson, Simms, and Knezek (2001-2002) examined possible links between Bloom’s higher-order thinking skills and the use of technology. The research was done among fifth and sixth graders at elementary schools in Texas. Based upon research, the group of students that used a variety of technology in their classroom, showed gains in their ability to evaluate better than students not using a variety of technology in their classroom.

Higher-Order Thinking Skills

Researchers performed a study addressing the question if students in a technology rich classroom showed better higher-order thinking skills (analysis, synthesis, and evaluation) than students of a traditional classroom. The subjects were fifth and sixth grade students enrolled in a technology-rich classroom magnet program in a school district in Texas. The students were chosen at random from the six elementary schools in the district. The comparison group was a group of students not enrolled in the magnet program, but had similar schools without a technology rich curriculum. The comparison group students were also chosen at random. Two treatment groups were created, one being sixth grade students made up of 20 male and 16 female, and the other being fifth grade students, 20 male and 23 female. Two comparison groups were also created they consisted of sixth grade students, 21 male and 22 female and fifth grade students, 23 male and 21 female. The treatment groups were given the use of computers in the classroom, with a ration of 2:1. The students were taught, by trained teachers, how to use spreadsheets, databases, and word processing software. They also learned how to use the Internet, other online sources such as the thesaurus, encyclopedias, and atlases. Scanners, QuickTake Cameras, HyperStudio, a multimedia presentation software was also taught to the
students. The comparison group did not have access to the computer or other technologies (Hopson et al., 2001-2002).

*Evaluation Skill Increased*

The students were given a pre and post test of The Ross Test of Higher Cognitive Processes; it was found that the treatment in both the fifth and sixth grade group had a higher level of evaluation skill than that of the comparison group (p < .01). The means and standard deviations were given; sixth grade treatment group M=22.19, SD=3.82, fifth grade treatment group M=20.36, SD=3.49, sixth grade comparison group M=18.93, SD=4.06 and fifth grade comparison group M=15.21, SD=4.72. The other skills tested, analysis and synthesis, showed no significant different among the two groups (Hopson, et al, 2001-2002).

It was concluded that there is a “minimal, but positive effect” on increasing higher-order thinking skills and a technology rich classroom (Hopson et al., 2001-2002, p. 114).

The researchers mentioned several factors that limited their study. One, being the population make-up, another, the lack of control of students’ use of computers and other technology at home, the limited study of only three high-order thinking skills, and finally the short time (20 weeks) allotted for the study to be completed (Hopson et al., 2001-2002).

Apple’s Classrooms of Tomorrow (ACOT) grants became the cusp of a long term study performed in several classrooms from around the country. From the schools involved in ACOT information was gathered which was to determine if the use of technology in a classroom benefited the students’ achievement abilities, writing abilities and attitude toward technology.

*Apple Classrooms of Tomorrow*

ACOT began in 1985 with the notion of incorporating technology in classrooms. In 1986 ACOT provided teachers and students in five school districts, from around the nation with
computers for school and home (Baker, Gearhart, Herman, 1999). The study’s focus was to look at if the everyday use of technology had an impact on teaching and learning in the classroom. Students and teachers had access to a variety of technology, including computers, printers, scanners, laser-disc, video players, modems, CD-ROMs, and several different types of software (Ringstaff & Kelley, 2002). A year later, the UCLA Center for Technology Assessment began a study to conclude if the use of these computers impacted student learning. The group gathered baseline information to use as a comparison over time. They wanted to measure, over a two year period, not only students’ achievement levels, but students’ writing ability, and attitudes. At the elementary level, the Iowa Basic Skills test was examined along with a writing sample. The writing samples were evaluated by using the Conejo Valley School Districts rubric (Baker et al., 1999).

Maintained Skills

Although no qualitative data was given, Baker et al. (1999), reported students with ACOT in the elementary level made no significant change when it came to the achievement of basic skills, stating ACOT students were able to “maintain” their scores on the achievement test. Baker et al. (1994) also stated, “the ACOT program was at least as effective in promoting commonly measured student outcomes as the more typical instructional programs provided by the comparison sites” (p. 4). At one ACOT site the data collected indicated an advantage for students with the ACOT, but again, no qualitative data was given.

Although the research indicated one ACOT site showed an advantage for those students, the above study showed that students in an ACOT classroom showed no significant growth for students in a classroom with technology.
The West Virginia state legislature performed a massive study on the use of technology in classrooms. With millions of dollars spent on this project, it was probably a relief to state senators and congressmen to find an advantage for those students participating in the study. The results showed improvements for students in the third, fourth, and fifth grades.

*Virginia Basic Skills/Computer Education*

Mann, Shakeshaft, Becker, and Kottkamp (1999) researched over an eight year period, The West Virginia Basic Skills/Computer Education (BS/CE), to determine if students’ basic skills (reading, writing, and math) would increase by integrating technology into classrooms. Funded by the West Virginian legislature, the study began in the 1989-90 school year. Each of the schools selected to participate, starting at the kindergarten grade level, were given several pieces of technology. This technology included four computers, a printer, and a school network file server. Each year, as the students progressed to the following grade level the technology would follow them. The schools also received software from either Jostens or IBM. Individual counties could choose which software they would like to receive and use in their school districts’ based on their curriculum and how the software met the needs of that curriculum. Several factors went into the selection of the school, one being location. The state was divided into four geographical sections. The schools were chosen from those areas. Another factor was socioeconomic status of the students within the school, with both low and high SES being represented by the 18 schools participating in the study. The model for BS/CE includes; software and computer availability and use + attitudes toward computers + teacher training and involvement in technology implementation decisions = Predicted change in Achievement Test Scores (Mann, et al., 1999).
Increases at Three Grade Levels

Data collected from 950 fifth graders from 18 elementary schools showed an 11% (statistically, more than a .001 confidence level) gain in the Stanford-9 Achievement Test (SAT-9). The SAT-9 tests’ basic skills portion is comprised of math, reading and language arts areas. Scores on these areas could range from 400 to 800, in West Virginia in 1998, the range of scores was 547 to 766, when compared to the previous years’ scores, 1997, and the average increase was 14 points. Researchers believe this gain could be even higher as the continual exposure to the technology over several years would attribute to other gains made between other years, i.e. first and second, second and third, and so on. Researchers also believe the gains could be higher from the beginning of the study to the end as advancements in technology were always occurring. Other results concur, third graders who had taken the California Test of Basic Skills, traditionally had an increase of 1.5 points per year or 6 points over a four year period, however, because of the BS/CE, third grade basic skills scores increased by 5 points in one year. Fourth grade reading scores became the second highest in the southern states due to BS/CE (Mann et al., 1999). As Mann et al. (1999) states, “the net result of the state’s initiative, its accomplishments and the procedures for this analysis makes West Virginia a potentially illuminate case study of innovation in instructional technology” (p. 26).

Over the course of this long-term study, the results indicated an 11% increase on the SAT-9 achievement test for fifth grades, an increase of 1.5 points per year on the California Test of Basic Skills for third graders and fourth graders were able to increase their reading scores to the second highest in the southern states. Researchers attribute these results to the BS/CE implementation in West Virginia (Mann et al., 1999).
The use of e-books was examined to see if there was a possible link between reading skills and young readers. Although all the students were read the same book, the way in which it was read to each group was different. Some students were read to by an adult while other heard the story electronically through the use of e-books. Also included in the research is related information pertaining to the use of e-books and younger aged boys.

**E-Books**

Korat and Shamir’s (2007) research was to determine the effects of adults reading a book to one group of children while an electronic book was used for another group of children. Two test groups were established based upon socio-economic status; Low socio-economic status (LSES) and middle socio-economic status (MSES). Within in each group three sub groups were formed, one sub group would be the control group, which would receive no intervention, another group had a book read by an adult, in the last group the children individually read the electronic book. The same book was presented to both groups. Several steps were taken to ensure consistency was maintained throughout the intervention. For example, the book was scanned so the pages the students saw were all the same (Korat & Shamir, 2007).

**Skills Increased**

The results showed that kindergartners who used the e-book comprehended the story and were able to learn new words that were in the story. The same was true for students who had an adult read the story and in both socio-economic classes. A parent reading with their children to increase fluency and comprehension is also very crucial to the development of a beginning reader. Parents may be aided with e-books (Korat et al., 2007).

It has been reported that little research has been done on the benefits of talking books and other similar software for “promoting reading-related skills” (Littleton, Wood & Chera, 2006, p.
However, in one study e-books have been found to enhance a child’s phonics skills, increase a child’s understanding of spoken language, and aid in the comprehension of a story. On the other hand, the interactive nature of e-books may distract students from the story. Others have suggested the animations used in e-books do not match what is happening in the story (Korat et al., 2007). A study, which included only 5-6 year old boys because of the concern of boys’ lower achievements in literacy, tested reading skills. The boys were pre-tested and divided into two groups. One group with a negative composite score was assigned the “lower phonological awareness group” where boys with a positive composite score were assigned the “higher phonological awareness attainment group.” The intervention found talking books, which were used through a CD ROM, may benefit boys with lower phonological awareness based on pre and post tests. Also found in the study, boys used the computer software in an appropriate way; using different features of the software to aid students in reading, which “suggests that the use of such software could have a potentially valuable role to play in supporting the literacy development of boys who are beginning readers” (Littleton, et al., 2006, para. 33). Computers may aid a child in reading a book “in terms of stress, pitch, and enunciation,” the child may also learn “positive examples for structure of the English language as well as for syntactical models,” and e-books may “provide content for in-depth thinking” (Ediger, 2004, para. 17).

Through the use of e-books was determined that students do gain reading skills important in becoming a good reader. Although no qualitative data was given, among the benefits, the research indicated students’ phonics skills, spoken language skills, and comprehension skills were all increased.
Although controversial one researcher suggests there is a link in the way a video game is played and the way a book is read. Students may gain insight into reading by applying the same skills used in video game while they read a book.

Video Games

Compton-Lilly (2007) suggests a correlation between how video games are played and how reading should be done. For example, video game players are risk takers, because in most video games when a player is about to attempt a challenging part, where death may occur, the player can save the game, continue, and take the risk of losing their turn or person. Readers and writers should be risk takers as well. For instance, when oral class reading is taking place many students are not eager to read aloud during class, often leaving when it is their turn to read. Writing has its place for risk takers too, especially when doing creative writing and spelling a word that is unknown to a student. Many look for easy fixes instead of taking the risk and attempting spelling a word on their own. When playing a video game the player needs to choose an identity, gender, special skills, or strengths. When reading, a student needs to assume the identity of a character in a story, for instance, if a child is reading a book about a mother dog looking for her lost puppy, the student will put themselves into the character of the mother dog or the lost puppy. A student must also form an identity as a reader. For most students creating a reading identity is an easy task, the students want to become good readers so identifying themselves as a good reader is easy. A video game also has to be challenging enough to keep the player interested in. If a video game is too easy the player becomes disinterested in the game. The game cannot be too difficult either otherwise frustration sets in. Video game players often will begin with an easy task for the video game then gradually the game becomes more difficult. Finding an easy book and working to read a more difficult one is the same with reading; a
beginning reader would not sit down and attempt to read a difficult novel. A scaffolding process takes place in both instances of playing a video game and reading a book (Compton-Lilly, 2007). The scaffolding aspect was suggested by Ediger (2004) as a way to help students with reading achievement. Students should begin reading at their appropriate level and advance to more difficult reading levels. The process in which video games are played and the way a good reader reads are parallel, in fact, a video game was responsible for increasing literacy scores 72 percent in just one hour of play, based on qualitative results. The game was tested and was aimed at children ages 10-15. Used by a professor at the University of Guelph, he wanted his students to enjoy learning about Shakespeare. As a result the professor incorporated this game into his curriculum. The game involved teaching literacy skills through the Shakespearian language (Fischlin, 2007).

Although controversial and more studies are available on the negative affects of playing video games, researchers believe there is a beneficial link between playing video games and becoming a good reader, as indicated in the 72% increase of literacy scores at the University of Guelph. As mentioned about not only do students have to think about the characters and how to connect with them in both a video game and story, the students also need to think about their level of play and level of reading.

The benefits of students paired with internet pen pals in to discuss literature were examined in two different studies. The first was the In2Books program that began in Washington D.C. Students were paired with an adult, whom read the same story as they student. Through letter writing the students corresponded with their pen pals about the literature. As a result, students SAT-9 scores increased. The second study mentioned was conducted with students in
New England. These students were paired with other students in Australia. Despite the limited use of technology the study can be applied to the use of technology in classroom.

*Pen Pals*

Teale & Gambrell (2007) involved urban teachers, adult pen pals, and students from the District of Columbia Public Schools (DCPS) to examine the In2Books (I2B) program. The program was designed to have students in grades 2-5 think deeper into the texts so throughout the school year and while participating in the I2B program. The students received and were able to keep, five books, all from different genres. The pen pals read the same book. The adult pen pals who are trained through the use of the website, Pen Pal Place, wrote engaging letters to the students about the books. In the letters the pen pals asked questions, wrote about important ideas, information within the book, and made connections to the book. Although the letters were submitted electronically, on occasion, students receive a “hard copy” letter from their pen pal.

The students involved in the study all came from the DCPS. Nearly 5,000 children, mostly from Title 1 schools, were involved in the program (Teale & Gambell, 2007).

*SAT-9 Scores Increased*

When compared to non-I2B classrooms, the I2B classrooms performed better on a standardized assessment of reading achievement. Students Stanford Achievement Test (SAT-9) scores, from grades 2-4 that participated in the I2B were compared to students’ SAT-9 scores from grades 2-4 that did not participate in the I2B program. Historically, students in this district “score at or near the bottom nationally on standardized reading achievement measures.” (Teale & Gambrell, 2007, p. 728) As the research indicated, reading and writing scores for students participating in the program showed achievements were found in the students who took part in this program. In a Veteran (teachers who implemented the program into their classroom for two
ore more years) I2B second grade classroom the Stanford Achievement Test M=584.5* (36.5). In a first year I2B second grade classroom the SAT M=580.5 (36.7) while a non-I2B classroom’s M=578.7 (35.6). I2B third grade classroom the Stanford Achievement Test M=626.9*** (47.7). In a first year I2B third grade classroom the M=612.9* (48.2) where in a non-I2B third grade classroom the M=607.7 (40.9). Similar results were found in a fourth grade classroom with the I2B Veteran M=637.3*** (46.1), first year I2B M=637.5* (44.3), and non-I2B M=626.8 (39.2) with *p <.05 ***p <.001 (Teale & Gambell, 2007).

High-quality books were linked to this gain in literacy, along with reading the books several times over, and discussing the book with peers and pen pals, and the writing of letters to pen pals. When the students wrote to their pen pals, it “engage[d] (the students) in a process approach to writing in order to compose the letters” (Teale et al., 2007, p. 737). Four other key features that contributed to the success of the program suggested by Teale, Zolt, Yokata, Glasswell, and Gambrell (2007) was the community created by the students, teachers, and pen pals. Students understood the advantages of learning from classmates and the advantage of working together. Another factor, students wrote letters to actual people, and as a result, felt their letter writing was meaningful. Teachers found students, who usually struggle with writing, reading, and spellings were excited to participate in writing letters. Students, through writing letters and answering questions from their pen pals, actively took part in higher-level reading, writing, and thinking. As a result students were able to increase their literacy skills. The third factor that led to the success of I2B was students learned grammar and other English skills through the use of letter writing; the grammar and writing were not taught separately, instead the two concepts were interwoven so students had a purpose for learning grammar. Finally, the last factor that contributed to the success of I2B, was the teachers changed their way of thinking. The
teachers realized the benefits to creating work that was more meaningful to students. They also learned students do not want to learn just the “technical” side of reading and writing, in fact, students wanted to incorporate those skills into a lesson in a purposeful way (Teale et al., 2007).

Necora Charron (2007) wanted to determine if there was a link between pen pals and student achievement. Students in 4 fourth grade classrooms, made up of 22 students, were paired up with Internet peer pen pals from Melbourne, Australia. Through interviews conducted by the author on participating teachers and students, before, during and after the course of the program, the author received qualitative data which was then analyzed using the NVivo program. Not all the fourth grade students were interviewed; five general-education students from each classroom were along with eight second-language learner students and fourteen students with individualized education plans. Through the qualitative research study, categories were developed from interviews with teachers and students. One category was communication. Students were writing to communicate with a real person, thus the letters the students wrote had a purpose. Another category, Cultural learning, was an important aspect of the Internet pen pals. The students were able to learn about different things around the world. The idea of learning about things from around the world supports social studies curriculum and, at the same time, teaches reading and writing. Just as in the previous study of Internet pen pals, the authentic audience is important, a third category. The students were able to write to a real person and get to know them. The students were aware of the audience and the use of proper “netiquette” when writing. Finally, the final category, the Internet pen pals program was motivating and engaging for students. Seven out of eight teachers reported seeing students more motivated to write when the class participated in a pen pal program. Students liked the Internet pen pal program because writing letters was fun and receiving letters motivated students to write their own letters using...
the computer offered some motivation as well. The students were motivated to write letters because the letter would be shared in class on the Internet. Special needs students and students learning English were also able to take part in this classroom activity (Necora & Charron, 2007).

In both pen pals studies, the use of technology was minimal; however the use technology was a motivating factor for students. Students, participating in the I2B program were able to engage themselves in a book while sharing that experience with an adult pen pal. The results showed students SAT-9 scores increased. Peer Internet pen pals from around the world can also teach children about the use of computer, but lessons beyond the classroom as well, as mentioned above students learned about communication, motivation, but also different cultures.
Chapter III - Results and Analysis Relative to Problem

So what does all this mean for educators? Should we throw away our computers and go back to paper and pencil? Should we rush to our superintendent and persuade him to order new computers for every classroom and computer lab in our district? Not all the studies and research above pertains to 3-5 elementary classrooms, however, based upon the research and the opinions of experts’ conclusions can still be drawn. There is no clear-cut answer to if the integration of technology in a 3-5 classroom is related to reading achievement. Ringstaff and Kelley (2002) noted there is research available to conclude there are benefits for using technology to improve student achievement. From evidence in the above studies, there are benefits to using technology in the classroom to increase a student’s reading achievement and overall basic skills, but considering technology and the relationship to reading achievement, the research is not there. Cummins, Brown, and Sayers (2007) state, “Despite increasing access to technology by teachers and students, no large-scale improvement in literacy or numeracy has been demonstrated” (p. 91).

However, throughout the above studies several common factors were discovered in the when successful implementations of technology occurred in the classroom. Those factors should be considered when discussing technology implementation in the classroom.

One Piece

Technology is “one piece of the puzzle” (Ringstaff & Kelley, 2002, p. 11). Several pieces need to come into play in order for technology to server its purpose in classroom; to aide in students’ learning. A computer or digital camera can be in a classroom, but without the proper use by the teacher the computer or digital camera is just that and not a learning tool. Teachers need to know how the use of a piece of technology will fit into the curriculum to benefit the
learning of the students (Ringstaff & Kelley, 2002). For example, in the ACOT researchers pointed, out students were particularly engaged when the computer was used not just because it was available for use, but because the computer best fit the needs of the assignment at the time. Researchers also claimed students preferred the use of computer software rather than the use of the computer for drill and practice. (Ringstaff & Kelley, 2002).

Attitude

In nearly all of the studies I looked into the attitude of the teachers and students were monitored. Teachers noted in the ACOT classroom an attitude change did occur when it came to several aspects. One being, student were putting in more effort on assignments, the student did beyond what was asked of them for assignments, and teachers also found that students spent more time on their work when they were using he computer. Sandholtz, Ringstaff, and Dwyer found students were eager to use available technology on their free time as well, often before and after school (as cited in Ringstaff & Kelley, 2002).

More importantly than the attitude of the students is the attitude of the teacher; the teacher is the deliverer of the message and if the teacher has a poor attitude about technology, more than likely, that attitude will be trickled down on the students. As Ringstaff and Kelley, asserted, “If technology is to be used in powerful ways—to support student collaboration, inquiry, and interactive learning—then teacher’s beliefs about learning and teaching must change” (p. 16). Martin (2007) noted that how the teacher feels about the technology has a great impact of how the children react to it. For example, when using an interactive whiteboard, the students stated that the words written on the whiteboard were “fuzzy” and as a result, the teacher had to switch to a different program. Other problems with technology like the highlighting tool and speakers on the computer caused the lessons not to go as smoothly as initially hoped. A solid
understanding of what the lesson is about before technology can be incorporated into the lesson (Martin, 2007). In one research study, the user friendliness of an interactive whiteboard and talking books proved to be difficult. Students were able to manipulate a whiteboard, however allowing the students to demonstrate this in front of the class took time and thus, delayed the lessons and the objectives of the lesson. The teacher felt it was difficult to continue with the lesson and allowing the students to contribute to the hands on nature of the whiteboard (Martin, 2007).

Professional Development

Before technology can be used in the classroom, knowledge of how the technology operates is crucial. Often if a teacher does not feel comfortable using the technology or implementing technology into the classroom instruction, a student or technical support helper is called upon to offer support. This lack of understanding of how to use technology is often why teachers choose not to use it, but rather gravitate towards more traditional forms of teaching, i.e., textbooks, “This lack of confidence and competence discourages teachers from engaging with alternative types of texts” (Sanford, 2005, p. 304). One of the major recurring factors attributing to the success of technology and increasing students’ achievement, reading achievement, or other subject areas was the professional development for teachers. In West Virginia, thirty cents of every dollar was spent on teacher training. The state of Virginia also provided 5,000 teachers with training for the BS/CE implementation (Mann et al., 1999). More professional development means more time teaching teachers how to use the latest pieces of technology and, more importantly, how to incorporate it into their classroom. In the ACOT implementation of technology, teachers were trained in several areas including telecommunications, basic troubleshooting, and how to use other software such as spreadsheets,
databases, and graphic programs. The ACOT was able to provide, at each school where ACOT took place, an expert that aided teachers with technical and instructional support. ACOT went above and beyond the realm of traditional professional development. With the assistance from the National Science Foundation and three school districts, ACOT was able to create three teacher development centers at three of the participating ACOT schools. At the centers teachers were able to witness, first hand, how the ACOT works within the school setting, they are also able to learn more about utilizing the new equipment and software into their curriculum. They also learn about other aspects as well, such as team teaching, alternative assessments, and project-based learning (Ringstaff & Kelley, 2002). Professional development allowed teachers to have a better grasp at how technology is used, and therefore, have a better experience while incorporating the technology into their curriculum.

For teachers involved in the I2B program throughout the course of the school year teachers were offered professional development, some of which was required and some was optional. The professional development changed depending on the experience of the teacher involved in the I2B program, for example, first year teachers of the I2B program attended 6 sessions focused on the fundamentals of the program. The first sessions involved an introduction to the program and further PD days involved the introduction of each of the genre types the students were going to read. The veteran I2B teachers PD focused on ways to become a literature leader in schools (Teale & Gambrell, 2007).

The I2B program especially noted the veteran teacher, or how familiar that teacher was with the wa the program operated. Each grade was divided into a category. Each category was whether the teacher had previous experience incorporating the I2B program into the classroom. In grades two and three the veteran I2B classrooms scored higher on the SAT-9 tests than the
other teachers implementing the program (Teale, et al., 2007). Professional development is the key when it comes to the successful implementation of technology into a classroom. The more PD a teacher has on a piece of technology the more confident they will feel about using technology and they will have a better attitude toward technology which will then be cast down onto his or her students.

_Funding_

The research into The West Virginia Basic Skills/Computer Education implementation causes one to wonder what made this implementation of technology different from other programs. The biggest factor was the amount of money poured into this program by the West Virginia State Government. There is no doubt the use of technology costs money. In West Virginia, the legislature’s funding of BS/CE was about $7 million per year (Mann et al., 1999). In other technology implementation programs like the I2B program the cost was $1,500 for a non-title 1 classroom. This included books and professional development for the teacher. However, in the 2010-2011 school year, according the I2B website the cost for title-1 classrooms was nothing (ePals, 2010).
Chapter IV – Recommendations and Conclusions

Pro-Active Educators

As state previously, the implementation of technology costs money; thousands or
millions of dollars, and often school district budgets and state budgets do not have the money to
allocate for new technology or the professional development for teacher to learn existing
technology. As educators we cannot rely on our school districts to provide our classrooms with
the latest of technologies. Nor can we rely on our school districts to provide funds for
professional development towards the use of technology. With that said, I would recommend to
educators to be pro-active when it comes to technology. Look for grants to receive new
technology, look for that free piece of technology, and look for that unused piece of technology
in the store room. Most importantly, teach yourself how to use it, as indicated in the above
research, professional development is a key to using technology, but if there is not funding for it,
the professional development falls on you. So finding that technological savvy person in your
school and asking them questions or using the Internet to help you is what you may have to do.
Technology can be a powerful tool in the classroom, but the power lies in the teachers’ hands
and teachers need to know how to use and implement technology before a student can use it to
achieve anything.

Everyday Use Study

With that I mind, I would like to see more research on the everyday uses of technology in
classroom and not the million or thousand dollar funding of large scale studies. What happens in
everyday classroom? I would be curious to know the effects of the use of PowerPoint in a rural
third grade classroom. I would want to know; Does a PowerPoint presentation given after a novel
is read impact vocabulary understanding for a student? Also, does a PowerPoint, with pictures
pertaining to the novel, impact comprehension for a student? The research on the use of PowerPoint could also be expanded into other areas of the curriculum, for example, in a rural third grade, does the use of a PowerPoint presentation about the adaptations of certain animals benefit student learning? The key questions to be considered are; Do students better understand what an animal adaptation is when taught using a PowerPoint? Also, do students better understand how an animal uses its specific adaptation when taught using a PowerPoint? The studies that would pertain to most educators are the studies that would be done on a small, inexpensive scale. Necora Charron (2007) suggests, research needs to be done so educators know what is available to students and teachers and the impact that technology has on student learning. The research needs to be done to support the schools districts purchase of the new technology.

Current Research

I also am curious to know where the current research is now. The studies on ACOT and West Virginia’s BS/CE were done decades ago. Yes, we can still use these studies to make conclusions about today’s technology, but a continuation of those studies or something similar would be good information to have available to educators. Up-to-date studies need to be performed to provide school districts and educators with the newest information. The research that still needs to be conducted is on specific pieces of technology, whether that means pieces of equipment, such as e-books, or on software such as Accelerated Reader or the Scholastic Reading Inventory. Qualitative data is not available to educators to know if these types of technology are worth the investment.

Summary and Conclusion

The use of technology in a 3-5 classroom does have positive affects on student learning, as far reading achievement specifically, it is difficult to determine based on what I have
discussed in this literature review. However, the West Virginia BS/CE implementation and the I2B program indicated clearly students were able to perform better on the SAT-9 after the implementation of technology occurred in their classroom. Technology does have a place in classrooms. However, several factors need to be considered when implementation technology, one is attitude; another is teacher professional development, and finally funding.
References


Necora Charron, N. (2007). “I learned that there’s a state called Victoria and he has six blue-tongue lizards”. *Reading Teacher, 60*(8), 762-769.

