

Chapter 2

Literature Review

Introduction

Many struggling readers do not have the technical resources or support or the skills to use technology. There is a need for remedial differentiated project-based activities incorporating the use of technology. Differentiated, project-based learning can promote increased literacy in students who are not diagnosed with learning disabilities but struggle with literacy. Technology provides opportunities to experience literacy instruction that extends to what is taught in a mainstreamed, traditional classroom. In order to promote technological project-based learning in the classroom, many factors need to be kept in mind. This project will explore what needs are to be met in order for struggling readers to be successful with their literacy in inclusive traditional classrooms.

Theory/Rationale

Students with special needs deserve the use of technology in the classroom because it is a basic human right. “Because access to the information of our society and our world is necessary for our survival, it is therefore a human right. So the billions of people who are being denied access to information because they can’t read or write are being denied their human rights” (Crossman, 2012, p. 51). Every child has the right to learn, and is unique in their specific way of learning, whether it be visual, auditory, or kinesthetic.

There is a need to eliminate the fear of disappointments in their feelings of inadequacy and replace it with positive esteem, and achievements. The use of technology can increase literacy achievements in these students. Crossman (2012) states that, “[a

student] and her friends are developing the very skills that will be required for successful K-12 learning as we move into the coming age of postliterate K-12 education,” (Crossman, 2012, p. 52).

Students also respond better to active stimulus curriculum, and we need to help students with special needs to be more prepared to transition into mainstream with updated computer and other technology skills. In addition, we need to use more technology to keep the interest level of student’s high. Because we live in a very digital, technological world, many schools are upgrading their uses of technology which makes this obstacle even more attainable. It has been known how important hands-on learning is to students. Learning through first hand experience will also allow students to use inquiry and make their own inferences. These different modes of technology will give these students the tools they need to be successful in school.

A constructivist approach would argue that active learning is the most optimal learning as students are engaged in learning by discovery. Because every learner is unique, use of differentiated instruction and technology certainly caters to all students. Each complex student can be encouraged with the use of technology in the classroom. All the various complexities of literacy ranging from a student’s degree and ability of listening, speaking, and talking are building blocks to letter sounds, phonetics, constructing words and forming those words to produce sentences. This all amounts to the significant factors of what it means to be literate. The role of technology from this viewpoint shows that it is an integral part of learning. It fosters unique, complex, individual learning where each student forms their own understanding and learning outcomes using technology to express themselves in this digital world.

Research/Evaluation

What research is finding through incorporating technology into the classroom is that not only does it enhance lessons and engage students, it is building confidence for them as well. There are factors which influence the big picture. Identified below are examples of how the building blocks need to be set in place for technological project-based instruction to be successful in order to increase literacy in struggling readers. This framework consists of six (6) items: 1) The increased availability and expectations for technology in K-12 education; 2) Factors that contribute to the benefits from technology in K-12 education (including teacher professional development); 3) successful PD for technology integration; 4) Students' use of technology that improve learning; 5) Project-based activities that incorporate technology and 6) Project-based activities that will increase literacy. Without the first three factors, it is difficult to use technology effectively in project-based learning activities in the classroom. As described below, without the availability of technology and professional development, it is difficult to implement technology in the classroom. Those building blocks need to be in place before the other factors are implemented.

Increased availability and expectations for technology in K-12 education

Computer literacy is no longer enough, but being technologically literate is even more important in the 21st century. As mentioned earlier, students need to think critically, work in teams and produce and implement useful projects. Students need to be using technology across all subjects in order to obtain information technology skills, but will be able to use the skills to think, research and learn (Boone, 2009). "The No Child Left Behind Act mandates that each student be technologically literate by the eighth

grade and requires states to report proficiency levels to the federal government” (p. 68). Students must be actively engaged in rigorous and focused learning using the technologies of today to be creative critical thinkers.

ChanLin, Hong, Horng, Chang and Chu (2006) state that the use of technology has become a new trend for learning. In disagreement, rather than a trend, it is a curricular standard and benchmark that is here to stay. Whether teachers have accepted the logic for using technology in the classroom or not, the evidence is clear: students in today’s society need to be technologically literate. Teachers from this study stated that they would be willing to accept an incentive: to invest more time in learning how to be creative with technology if class hours towards seminars (outside of work) could be reduced. Also, teachers who are working as a team will be more willing to use technology than if working individually.

Factors that contribute to benefits from technology in K-12 education

There is an obvious divide regarding the availability of technology between institutions that have it, and those that do not have the funding to acquire it. There is also a gap between the availability of technology at school, and the lack of technology in the students’ homes. There also exists an issue of the obvious gap between the technical knowledge that some teachers do and do not possess in many schools across the United States.

Sandholtz and Reilly (2004) argue that if teachers are able to focus on the development of their curriculum, teachers are likely to effectively and creatively use technology without having to worry about the expectations of technical skills. By reducing these technical expectations, teachers can enhance their instructional use of

technology effectively. Personal technical skills are also a must to using technology as a teaching tool before trying to implement it into the classroom. If teachers' expertise is limited, then their ability to use it in the classroom is limited. When teachers expand their use of technology, such as their knowledge on literacy and math software programs, they become common and known. The students in this study became more involved in the creation of their own material, and using the Internet as a source. They have been able to use the Internet for research, and communicate with other students through email, use digital cameras. Their peers have been able to critique their work online, and also use presentation software to create their own books. In addition, subject content and curriculum are most significant with technology to support learning objectives.

Hew and Brush (2007) focused on strategies to overcome the barriers or factors that impede the use of technology. They discovered ways and ideas to overcome the lack of technology and access to technology, the lack of time and technical support. They also focused on technology integration plans, and the attitudes and beliefs of the teachers. Certain solutions included creating a technology setup in classrooms that involved more economical computer systems, having a shared vision, and provided professional development to name only but a few. When these barriers are overcome, technology can be successfully integrated into the curriculum.

Another factor that is a huge issue is the availability of technology to teachers. Norris, Sullivan and Poirot (2003) summarized their findings on the technology usage in K-12 schools, the access to computing technology between teachers and students in schools across the United States, and the relationships between the access to technology and its use by the teachers and students. Technology access and use was the largest issue

and predicted the technology uses of teachers were measures of the access and availability. The authors believe that certain people that do not support technology and its use to improve instruction are for the wrong reasons. If technology has not had a positive impact on teaching and learning, it is only because of the lack of technology access. It is predicted that if the access to technology is increased, technology will have a significant and positive impact on teaching and learning within the classroom.

Reinhart, Thomas and Toriskie (2011) found that students in low socioeconomic conditions were likely to be taught by teachers by a simple means of technology, whereas more prosperous schools had more support from teachers that integrated technology and helped develop higher-order thinking skills. The biggest concern was the availability of technology and how the technology was not being used in the most extensive way. The authors believe that it is imperative that teachers receive ongoing professional development. As education changes, so does the need for learning of new technology usage. The most important focus is the integration of technology and to promote higher-order thinking skills. The authors believe the school districts should support teachers with support and training which can improve these foci.

These barriers and factors, when overcome can result in an optimal increase in technological knowledge for both students and teachers. “The skilled technocrats of the future reside in the pool of students being taught today.... and will provide the leadership in a technological world that demands highly developed critical thinking skills” (Reinhart et al., 2011, 191). Sadly, the study demonstrates the minority of students, as teachers from schools that struggle with resources do not promote higher-order thinking skills with the use of the integration of technology.

Successful teacher professional development for technology integration

Before any implementation of any technological programs within the classroom, the educator needs to know how to use technology effectively within the classroom. Many teachers receive professional development within their schools, to keep up with the times, and provide the most up-to-date knowledge of certain software as well as technological devices. Some teachers do not feel as comfortable using technology in their classroom and often seek the advice from their coworkers, or sometimes refuse to incorporate technology. With the proposal that technology will increase literacy among struggling readers, it all begins with instruction, and how it is taught. The most important place to begin is teacher preparation (Karchmer, 2001).

Many teachers may have numerous years of teaching, but have limited experience incorporating technology into their everyday routines and practice (Marino, Black, Hayes & Beecher, 2010). This author believes that the teachers' content knowledge may not have a positive effect on student achievement, but the interactive nature of technology and how it enhanced the curriculum. The authors found that interactive, hands-on materials improved the reading performance in struggling readers, particularly those with reading disabilities.

Trained specialist teachers may be able to provide training to their coworkers. In a rural area of the United States, a group of at risk academic children were studied who were found to be in high poverty areas and isolated geographically. Studies have shown that these children can be helped by further help more explicitly outside of their regular classroom (Vernon-Feagans, Amend, Kainz & Ginsburg, 2009). Evidence was

provided that a trained specialized teacher could improve the reading outcomes in the students.

Vernon-Feagons, Kainz, Hendrick, Ginsberg & Amendum (2010) propose that by emphasizing the development and evaluation of professional development programs for teachers, it will improve the reading and instructional practices in students. Intense training programs for teachers “learning while doing” can produce more knowledge and practices in teachers. Children who were impaired readers could be helped by the classroom teacher with the consultation from research staff (Speece, Case & Malloy, 2003).

A study was conducted where students received instruction through face to face meetings for three days, then biweekly meetings through the use of technology. A laptop computer and webcam were given to each experimental teacher who received instruction and training from a TRI (Targeted Reading Intervention) consultant (Vernon-Feagons, Amendum, Kainz & Ginsburg, 2009). This real time instruction helped the teacher and student deal with the issues at hand. The intervention was cost effective, and was just as effective as face to face consultation when teaching letter-word identification and Word Attack. This professional development via webcam every two weeks was effective in helping the teacher, and aiding the struggling reader.

Students’ use of technology that improves learning

In a small rural school in Byron Center, Michigan, NWEA testing is administered. This is a computerized assessment taken 3-times-a-year. Significant gains in both language arts and mathematics have shown dramatic improvements in test scores in both

of these areas. Prior to these assessments which are given early fall, winter and spring, the educator has promoted the use of technology in her room which is used daily.

Crossman (2012) speaks of a child who gained from technology in a holistic way which compares very closely with some autistic children in a first grade classroom at St. Mary's Visitation School in Byron Center, Michigan. He explains that by using all her senses, this student uses technology to help her. When beginning kindergarten, she did not know how to read or write. The message to her from the school was, "Since you don't know how to read or write yet, Jessica, you really don't know anything of value, you have no useful cognitive skills, and you have no real ways to process the experiences and/or the data that enter your brain through your senses..." (p. 49). This school did not focus on all her senses simultaneously, she was only able to use her sight, "and instead of experiencing information interactively – as a two way street that she could change by using her interactive technologies – she was going to have to experience information as a one-way street: by absorbing the text in front of her without being able to change it. This is a perfect example of why a mainstreamed school needs the hands-on technological learning – to help children like Jessica. It is schools like this one that would be a detriment to all children who have these special needs or struggle with literacy.

Fang (2006) discusses the importance of helping struggling elementary and secondary students develop literacy skills and motivation. Many computer related technologies include creating photo journals supporting phonics, virtual guided oral reading practice, hypertexts to study different stories and texts, and using live video chats. Software such as Inspiration is used to help organize information, and the use of handhelds can help record and chart data which is observed and animate cell structures in

science called 'Techno Books.' There is a focus on reflecting on the meaning of literacy today, and how new technologies can be used to impact the development in areas of word recognition, fluency, comprehension, vocabulary, reading and writing across the curriculum. Students are able to develop literacy, writing skills and motivation in a computer-related technology environment.

Craver and Burton-Radzely (1998) state that in using technology to promote literacy, a national survey of special educators believe that:

Across the board, interviews state that technology allows students with disabilities to accomplish things they otherwise could not do without difficulty, or could not do at all. They say that technology increases students' access to educational material and helps develop literacy skills. It motivates students to learn, increases ability to focus on material and improves student attention span. Technology also increases task completion, eases teacher monitoring demands, and raises the level of student independence. (pgs 16-17).

On the flipside, a study conducted by Slavin, Lake, Davis and Madden (2010) found that technology had minimal impacts on struggling readers. Computer-assisted instruction software and modern instructional technology did not benefit children's specific needs in reading. They recommended that programs should provide extensive professional development for teachers and are more effective than programs that provide technology and other involvement that do not change the daily teachings of teachers.

Fasting and Halaas Lyster (2005) found that by using MultiFunk, a computer program to assist reading has the capability to support the development of literacy skills in a vast group of struggling readers and spellers. The teachers came to the conclusion

that the struggling readers needed supporting dialogue to understand what reading strategies they possessed. The authors of this article also found that the results do not suggest that the computer technology they used was effective without the support of a teacher.

Project-based activities that incorporate technology

Dow (2007) discusses that with the help of a library media specialist, educators can discuss plans to integrate technology into the curriculum. Students can become knowledgeable in learning how to locate and evaluate information that they search for and become independent learners. Students can also control their own learning and solve problems. This can be conducted through project-based learning activities, which are assessed after a one page contract is signed by teacher and student stating that the activity is both information and technology literate. This learning activity can be electronically stored for review and assessment. New learning outcomes for students include blogging, wikis and podcasting if students and teachers what to stay current with Web-based communities. The information retrieved by the student can be shown in different activities that are presented in an exhibit, library media center, or Web-based resources.

Karchmer (2004) argues that school may be the only place students have access to the Internet, so it is imperative that they receive the biggest opportunities during the school year to interact with it. The Internet may also be the most powerful classroom tool giving students unlimited libraries, and connections to the curriculum and the real world. Collaborative Internet projects are used which connect classrooms all over the map. Students share their findings via the Internet through essays, book reviews, poems, and other written work. Technology has to be taught in a meaningful way which will

stimulate student thinking or support background knowledge, and used “as a tool for achieving higher-level thinking and a means of supporting background knowledge” (p. 333).

In West Virginia, the West Virginia K-8 techSteps Technology Literacy Initiative, a project based approach, was implemented. This aligns with the National Educational Technology Standards. This approach includes technological activities for each grade level, and aligned with their curriculum. Technologies, such as the Web 2.0 tools were used to elaborate what students learned (Boone, 2009). Students created digital stories that could be used for personal narratives or for history units. Students build on their own knowledge and experiences and monitor their own learning by using rubrics. Students are very successful being able to communicate and collaborate certain technology concepts.

Some other forms of project-based learning can be with the creation of a WebQuest, which is an inquiry-based lesson in which learners obtain information mostly or completely from the Internet. Some students in West Hartford, Connecticut created graphic organizers to share their ideas and plans for their WebQuest. A technology literacy teacher and library media specialist help the students learn how to evaluate Web sites. Students were required to learn Microsoft FrontPage, and to select media from different sources. These students also used a rubric to self-assess themselves based on content and design (Van Leer, 2003). Using course outlines, this unit was also tied to their curriculum standards, was differentiated for each student, and fostered much creativity, planning, and critical thinking.

Technology is shaping peoples' lives and could be a key role supporting development of critical thinking in today's classrooms. Given the adoption of Common Core State Standards (CCSS), technology is not being taught as subject, but is incorporated into CCSS in the classroom. Students are expected to express themselves using digital literacy and technology is also integral to conceptions of literacy with the use of adaptive testing such as the Smarter Balance assessments. The use of technology is definitely where the future resides.

Project-based activities that will increase literacy

With a strong emphasis on hands-on technological activities, struggling readers who have not been diagnosed will increase their literacy rates after working on project-based technological activities within a mainstreamed classroom. They will have the chance to use student centered projects that will include use of the Internet, self voice feedback intervention programs, e-readers, digital games, WebQuests and SmartBoard activities. By using pre and post literacy assessments, I will hopefully be able to know where the students skill levels are, and observe the growth of the students' word recognition, phonetics, comprehension, and fluency. These project-based learning activities that I will create will be at their instructional reading level. I believe that working with peers, in collaborative groups will foster a greater motivation for learning. I will also use independent activities and assignments which will hone in on different key skills such as reading response journals.

Summary

Research shows that technology is a fundamental part of education in today's world. Much emphasis is put on creating critical thinkers and preparing students to

evaluate and synthesize innovations based on information that they have collected through a classroom setting. Technology is not only seen as a tool, but a means by which student's of today's world grasp concepts with greater interest. Students today have the potential and ability to work at a quicker and faster pace. Educators need to be capable to challenge students and enrich, empower and nurture what is already evident and existing in today's time. The growth of technology has grown much over the years and teachers who have been in the work force for many years need to be one step ahead of what these students are already aware and capable of. By removing technical issues, and focusing on the curriculum and materials that need to be taught, it is imperative that educators maintain their professional development. Where socioeconomics are an issue, it is the district that needs to step up and support educators and provide students with the knowledge that the No Child Left Behind Act instituted.

Teachers should be capable of educating the students in a creative, engaging manner, and to provide a learning environment that is conducive to all learners. By using project-based differentiated activities, all students may be successful, creative, innovative, and engaged. This will allow for the natural growth and development of their literacy skills which includes fluency, word recognition, phonetics, and comprehension.

Conclusion

Based on the results of these studies, I will be creating project-based activities for students in my first grade, general education classroom. These activities will be student-centered and focus on critical thinking skills, as well as to build on previous knowledge, promote classroom dialogue, and focus on lower elementary literacy skills. These activities will hopefully encourage students and foster confidence and engagement. The

students will hopefully show growth in their literacy skills after being immersed in this unit of study.

Chapter 3

Project Description

Introduction