HOW DOES TECHNOLOGY IMPACT A STRUGGLING ADOLESCENT

STUDENT'S WRITING PROCESS

By

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled *How does technology impact a struggling adolescent student's writing process* by Benjamin E Duffy, Candidate for the Degree of Master of Science in Education, Literacy: Grade 5 to Grade 12, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.

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Abstract

Technology is an ever-changing tool for educators. This Masters project was designed

to demystify technology and show teachers how struggling writers can be impacted by

proper usage of technology in the classrooms. A professional development workshop

for educators was designed to share findings from the research findings that examined

technology applications in the four stages of writing: Planning, drafting, revising, and

publishing . The workshop was based around hands-on group work to foster ideas in

the teachers to bring back to their classrooms to better reach those students who

struggle with writing. Embracing today's students and their technical skills, and how

to transfer these skills into a chance for academic is the goal of this project.

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Chapter One Introduction

Statement of Problem or Issue

Classrooms of today look vastly different than they did even ten years ago. Today most teachers have some form of technology at their fingertips. Smartboards, iPads, laptop and desktop computers are common sights in classes. Technology's place in a classroom has been established. The explosion in technology-based solutions and their potential to meet the educational needs of all learners has been cited repeatedly over the past decade (Okolo, Bouck, & Courtad, 2007). The question posed now is: What impact does technology have on struggling adolescent writers? Teachers want to help their students achieve success; they want to reach all learners in their rooms. How can teachers today effectively use the technological tools to help their struggling students' writing process? The answer to these questions is held in the technology available to teachers today.

Students and teachers have the chance to utilize such technology to support and enhance the writing process like never before. The printing press was the first form of technology to impact schools, students, and teachers. Since then, schools have seen a wealth of changes from mobile carts that played VHS tapes to mobile iPad carts. Today a classroom that has only a chalkboard, or dry-erase board, is seen as low-technology. Interactive smartboards and laptop computers are the new norm for teachers and classes. Within these technologies lies the biggest impact for struggling writers. The New London Group (1996) argues that literacy pedagogy now must

account for the burgeoning variety of text forms associated with information and

multimedia technologies. Teachers must be able to use multiple forms of literacy,

including technology literacies, to impact all of their students, especially those seen as

struggling.

The research question driving this project is: What does research say about the

impact of technology on struggling adolescent students' writing process?Secondly,

but as important, is: How can teachers apply the technology to support such students'

writing?

To answer these questions, a review of the empirical research relevant to the

technology applications in the writing process has been conducted. Based on results

of the literature review, a professional development workshop will be created with

two goals in mind: 1. to inform teachers of the current research on using technology

with struggling adolescent writers to enhance the writing process, and 2. to

demonstrate evidence-based technology use in classrooms with adolescent struggling

writers. The workshop participants will learn the impact of technology on the

struggling adolescent writers' writing process and how they may best implement the

technology in their classrooms.

Background

Who are struggling writers? How are they defined? Graham, Schwartz and

MacAurthur (1993) note that these students tend to produce writing that is shorter,

less coherent, less refined, and more riddled with mechanical errors than that of their

typically developing peers. Graham and Harris (2005) suggest that children with special needs typically struggle when learning how to write. Lenski and Niersthmeir (2002) maintain that "students who are experiencing difficulty with writing typically use fewer strategies and their strategy use tends to be rigid rather than flexible" (p.129). The reasons for struggling writers' difficulties are as varied as the students themselves.

It is important to note that the term Learning Disabled (LD) has been widely used in literature when referring to this group of students. This term brings a negative connotation that the students are in some way broken with no way to help correct, strengthen, or improve their skills, in this case with their writing. This researcher does not support the use of the term LD because of this and instead will use "struggling writers" within this project. This researcher defines a struggling writer as not only having other areas of academic needs, but a student that, for whatever reason, has difficulty transcribing ideas onto paper in a thoughtful, meaningful way. The students focused upon in this project are not disabled. Instead, they require extra help in areas to strengthen their writing.

While the causes as to why a student struggles with writing may not be clear, students who struggle with writing share similar needs in their writing. Struggling writers minimize the role of planning (Graham & Harris, 1996). They use a retrieve-and-write approach to writing where little attention is directed to the development of goals, the constraints imposed by the topic or the needs of the reader (Graham & Harris, 2000). Also, such students limit their efforts to revise their pieces while

focusing on areas that have little impact on the quality of their writing (Graham, MacAurthur, & Schwartz, 1995). It is up to the teacher to help strengthen these students' writing. Programs and technologies are available that can, and will, help such students. It is the goal of this project to shed light on such technologies and programs to help improve struggling writers.

A myriad of writing approaches have been developed to teach writing. Writing workshops and several research-based recommendations have been employed by teachers (Been & Steenwyk, 1984; Brodney, Reeves, & Kazelskis, 1999; De La Paz, 2005; Fletcher & Potalupi, 2001; Page-Voth & Graham, 1999; Saddler & Graham, 2005; Yarrow & Topping, 2001). The following examples are not to be seen as the only available resources for writing instruction, but rather a starting point for teachers to reference. Fletcher and Potalupi (2001) propose a writing workshop approach to build skills of all types of learners. Students are free to explore new ideas, to try new sentences, and have the ability to create their learning in a structured environment. According to Fletcher and Potalupi (2001), "The teacher sets up the structure, allows students plenty of choice, and gets them writing" (p. 3). Students are encouraged to try new ways of writing and to accept the setbacks that come with writing. In this way students see writing as a process, not just a simple task. "We don't want to teach our students *the* writing process; rather, we want each one of them to find *a* process that works for him or her" (p. 62). In the writing workshop, the stages of writing are allowed to be modified by the individual learners so that each may write at his or her own pace.

A general writing process starts at the prewriting stage and develops an idea of the piece through some type of graphic organizer. Students then moves on to a rough draft stage where they are encouraged to just write. "[W]e encourage students to concentrate on getting a chunk of text onto the paper" (Fletcher & Portalupi, 2001, p. 64). The focus here is to write out their ideas from the organizers and get the main points down. In the next step, revising and editing, students work independently and together on polishing up the "chunk" of text into a meaningful piece of writing. "Revision is a composing tool; editing involves the surface features of the writing" (p. 66). Students edit their pieces by correcting spelling and grammatical errors. Students revise by rereading their pieces and make meaning-based changes in the draft to improve clarity, and sharpen their writing. In proofreading, students make sure their pieces are reader friendly, free of grammatical and spelling errors. As well, students focus on the meaning of the pieces and make sure they make sense. In publishing, students can either formally or informally publish their pieces. Informal publishing can be as simple as posting it on the wall in the classroom, while formal publishing can be recopying stories for audiences (Fletcher & Portalupi, 2001).

De La Paz (2005) recommends using a strategy instruction for teaching adolescents how to write. In this study, the students used two mnemonic devices, STOP: Suspend judgment, Take a side, Organize ideas, and Plan as they write. They also used the mnemonic device DARE: Develop a topic sentence, Add supporting details, Reject an argument for the other side, and End with a conclusion. In both of these devices, the students learned how to plan their piece and to stick to the topic

chosen. Each worked separately on crafting his or her piece. De La Paz emphasizes writing strategies that students can use independently to keep them focused on their pieces. Using the mnemonic devices, the students can remember the steps and continue to reference the pieces to ensure they are moving their topic along correctly.

Bean and Steenwyk (1984) surmise that adolescents' ability to concisely and accurately present information in writing improves when they are taught to summarize reasoning. The authors created six rules for written summarization. In each of the six rules, students were encouraged to summarize information presented in two paragraphs by their teacher. Students were shown how to be brief in their writing by avoiding using needless sentences or redundant phrases. After the summarization activity, the students used the technique with their writing and learned how to keep their writing more focused and on topic.

Yarrow and Topping (2001) suggest that peer-assisted writing should be used by teachers to improve all students' writing ability. In their study of 28 sixth grade students, Yarrow and Topping focused on the adolescents working together to plan, draft, revise, and edit their pieces. The researchers paired struggling writers with higher-achieving writers. They found that "[w]ithout the continuing support of their 'helpers', the interactive 'writers'' quality of writing tended to decrease" (p. 278). The study shows that students paired together can produce well-written pieces of writing. Modeling good writing techniques by stronger students to those that struggle was the main goal of this study.

Saddler and Graham (2005) continue this line with peers assisting one another while writing complex sentences. Students worked in pairs to combine simple kernel sentences into complex sentences. After working on several combined sentences together, the students worked independently to combine sentences. Saddler and Graham suggest that "findings from the current study replicate and extend previous research by showing that a peer-assisted sentence combining treatment can improve the sentence-construction skills of more and less skilled young writers" (p. 53). Again, results showed that the skills of weaker students were strengthened after the peer-assisted instruction and practice.

Page-Voth and Graham (1999) noted that setting clear and specific goals at the onset of writing produces better written work in persuasive essays. They maintain that all students need to identify the purpose of the writing assessment and expectations for the end product. With this breakdown of the writing process, Page-Voth and Graham (1999) argued that students would pay closer attention to the details being used in their essay, which would result in better written work. Their study "demonstrated that the performance of struggling writers can be enhanced by setting specific writing goals" (p. 239).

Brodney, Reeves, and Kazelskis (1999) show that engaging adolescents in activities designed to help them gather thoughts and organize their ideas lead to better written pieces. Results "offer strong support for the tenet that the prewriting phase, identified as the initial phase in writing process models, is essential to the creation of

a well-organized, cohesive composition" (p. 10). Time devoted to prewriting was shown to be beneficial for all writers.

In the writing approaches and studies discussed above, the purpose is to improve the writing ability of each student. Each study notes the importance of keeping all writers focused, with a set plan, during the writing process. As well, they point out specific pieces of the writing process from development to drafting, revising, and publishing aimed at helping struggling writers. In each, there are components that can be applied by teachers to help those that struggle. Though some studies did not specifically target struggling writers, the methods proposed and studied are applicable to strengthen struggling writers.

For the purpose of this project, the term technology will refer to any electronic device used by a teacher during the writing process. Digital graphic organizers, videos used to teach lessons, computers used for peer editing, and any electronic means of publishing the writing are all examples of technology. Technology has been connected with writing ever since the creation of the written word. Forms thought of as crude now were once cutting edge. The printing press revolutionized the way authors could reach audiences. Noted by Ditmar (2001), "[b]etween 1500 and 1600, European cities where printing presses were established in the 1400s grew 60% faster than otherwise similar cities" (p. 1134). Computers, and other forms of technology, are having the same impact on the youth of today. Yet, simply placing a computer in a classroom is not the magic bullet cure. MacArthur (2010) notes that word processing by itself has minimal impact on written products, but in combination with instruction,

it can help students develop better writing skills. Teachers need the knowledge of how to best use the technology in their rooms to better engage their students. MacArthur (2009) also suggests that "[t]he key issues in successful use of word processing are access and integration with instruction. Schools need to provide adequate access to computers for students to complete both initial drafts and revisions with word processing" (p. 94). Technology itself is not the impact; the impact comes from instruction. Larson (2006) comments that

> by shifting the focus of the teaching and learning of literacy from
> an autonomous model to include a multiple literacies perspective,
> we can construct authentic spaces for learning that prepare students
> for equitable participation in a global communication and
> information economy. (p 325)

Teachers need to embrace technology available to bring it meaningfully into their classrooms. The entire writing process from brainstorming to publishing may be impacted with the use of technology in ways not used before. Those students classified as struggling have the opportunity to write pieces on computers that would not have been possible even ten years ago. Students today are far more versed in technology than their teachers, as Prensky (2001) points out. Today's students are digital "natives" and the teachers are "migrants" (Prensky, p 21). Students today are more equipped with the knowledge of how to use technology than they were at any other time in history. It is the teachers of today who have to figure out how to implement technology effectively in their classrooms. King-Sears, Swanson, and

Mainzer (2011) point out that "[t]his technology can be universally beneficial for all students as a vehicle for learner engagement or conveyance of instructional content, and it can also promote participation, learning, and performance by students with disabilities" (p 509). The question remains: How can teachers make the most of these technologies?

Rationale and Theoretical Stance

Technology has found a place in the classroom. The task now is to effectively use it. This project attempts to show teachers just how to accomplish this. The field of education has found itself immersed in an era of accountability (Sundeen, 2007). Daft and Lengel's (1986) Media Richness Theory will be used as the theoretical framework for this project. In their work, Daft and Lengel focus on the message exchange of users to audience. The idea that the choice of appropriate media enhancing the overall effectiveness of a message is intriguing. Using this framework, teachers and students can evaluate what message is constructed in the writing and how effective that message is on the students' intended audience. The personalization and variety of language used by the students in their message, whatever that message may be, is where technology has the biggest impact. Students are able to craft many messages of differing substance from a traditional essay to blogs and multimedia text messages. Harnessing these medias and focusing the students on the ambiguity is the primary focus. Luckily for teachers, Sweeny (2010) points out that students do not

view technology as something new or complicated. They come to many classes with an understanding of how to use the technology already in the room.

Vygotsky's (1997) (reprinted from 1926) theory of social constructivism will also be used to support the teaching of writing using technology. The idea of social interactions reinforcing personal thinking process is central to the idea of helping a struggling writer. Through the studies to follow, the technology is not the golden ticket to helping a struggling writer but a means to help improve their writing. A teacher has to be able to set up the classroom, to use the tools effectively, for the struggling writer to find success. Some amount of scaffolding will have to be done by the teacher, and in cases the peers, to further set these students up for success. Simply placing a struggling writer in front of a piece of technology does not make for a fix. As Yarrow and Topping (2001) stated, when a struggling student was left on his/her own, unguided, their work did not improve.

Technology can be a powerful tool for struggling writers. Studies reviewed in this chapter outlined specific reasons how technology can help students that struggle with writing. Students that struggle were identified as those who take longer to produce pieces that are shorter and less defined than their peers. The purpose of the project is to show why teachers should use every piece of technology in their classrooms to help their struggling students. In the next chapter, how the technology can impact a struggling student's writing will be addressed.

Chapter Two Literature Review

How does technology impact an adolescent struggling student's writing process? Answering this question is the goal of this project. Effectively incorporating the technology to help struggling writers is the main area of concern for the researcher and the reason this project is undertaken. Teachers need to be aware of the new tools at their disposal to help their students' writing. In the literature review section, the term Learning Disabled (LD) will be kept intact it was used by researchers. Four of the studies discussed students as being Learning Disabled, yet none explicitly stated why these students were classified as such. The other studies used in this review did not make mention of the term LD. This researcher, where allowed, used the term struggling writer in place of LD because of the problematic connotation of the term *Disabled*.

This literature review chapter looks at the stages of the writing process and examines how technology impacts each stage. A review on technological applications in the pre-writing stage begins this section. A look at ways teachers could incorporate technology into the drafting, peer editing, and revising stages follows. Finally, it is a discussion on the publishing stage of the writing process. The theme in this literature review was that technology supports struggling writers as they progress through the writing process of brainstorming to drafting to revising to publishing. Many researchers cautioned that careful attention must be paid by teachers to make sure they are effectively using the technology. This chapter ends with an examination of research surrounding professional development.

Technological Applications in Pre-writing Stage

Effective writing is a process with specific stages. Students who struggle with writing need support in many of these stages. They struggle not only with basic writing skills such as spelling, sentence formation, capitalization, and handwriting, but also with the cognitive processes of writing such as planning, organizing, and writing (Lancaster, Shumaker, Lancaster, & Deshler, 2009). Teachers are responsible for teaching their struggling students effective strategies to become better writers. This starts at the pre-writing stage. Troia (2006) points out that students considered Learning Disabled (LD) tend to start writing immediately after being given a writing assignment and pause only slightly to formulate the beginning sentence. Troia (2006) notes that effective writers take up to 70% of their time on planning their pieces and mapping out their thoughts. Struggling students need to take the time to plan out what they are going to write. Graham (1990) found that LD students typically spend six to seven minutes planning their writing assignments, which is far shorter than their counterparts who do not struggle with writing. When the LD students were asked to generate ideas, they came up with four times as much information, half of which was useful.

In a study of 105 students, Wang and Dwyer (2004) found that effective concept mapping activities help overcome difficulties in processing, organizing, and applying the information. "By using concept identifying mapping strategy, the students' attention was primarily focused on interacting with those key concepts" (p. 8). This attention translates into a higher score in the study by Wang and Dwyer and

showcases the need to use concept mapping for students. As shown by Brodney, Reeves, and Kazelskis (1999), engaging the students in pre-writing activities helps to strengthen the concepts and promotes stronger writing. Saddler, Moran, and Graham (2004) also indicate that effective strategy instruction in planning helps those students who struggle. Saddler et al. used the mnemonic device POW, Pick an idea, Organize the thoughts, and Write more. Saddler et al. found that all of those in the study made improvements in their personal narrative writing. "All but one of these students produced post treatment personal narratives that were longer than their baseline papers" (p. 14.). In the writings of the other students, Saddler et al. found improvements in the time spent planning, that is, the students began spending more time in prewriting after the study than they spent before. Such studies did not use mnemonic devices like De La Paz (2005), but they did focus on spending more time in the pre-planning stage than is typical for struggling writers.

Studying 1,540 urban high school students, Brown (2011) found that students did not understand how to brainstorm, or how to use a computer to map out their pieces. In her baseline essay, the students wrote without mapping their responses because the students did not see a value in mapping. When the students were explicitly taught how to use the graphic organizers, they took seven days of work on just pre-writing and concept mapping. "Once students completed their essay organizers, their ability to focus on what they were writing increased" (Brown, 2011, p. 17). This pre-writing led to better written responses and better scores on the essay.

The students reported being better able to write their responses while using an

organizer and that they find value in creating an organizer while using a computer.

Researchers have studied the impact of computers on struggling writers' skills

at the pre-writing stage. Royer and Royer (2004) studied 52 ninth and tenth graders

from a biology class looking at the differences between pen and paper concept maps

versus computer generated concept maps. They found that "students that used

Inspiration created more complex maps than the students who created maps with

paper/pencil" (p. 73). They further noted that students preferred using the computer to

create concept maps. Of 26 students surveyed, 23 "agreed" or "strongly agreed" that

they understood how to use the *Inspiration* program to make a concept map. Twenty-

two students "agreed" or "strongly agreed" that the computer helped them develop

their concept maps more completely. Finally, 25 students "agreed" or "strongly

agreed" that if they needed to make another concept map, they would prefer to use the

computer rather than paper/pencil (p. 76).

Computer-based organizers come in many varieties. Gallavan and Kottler

(2007) suggested that teachers can use digital graphic organizers to make learning

manageable. Such organizers allow struggling students to plan their writing to avoid

confusion in the piece, which keeps the students on track (Gallavan & Kottler, 2007).

Using the computer to organize their thoughts, struggling students have immediate

visual feedback on their progress; they see right away progress made in terms of

length of the piece and how well their ideas work together. Gallavan and Kottler

(2007) added that as the learning unfolds, teachers and students return to their digital

graphic organizers to record new discoveries in a different section. Students can come back to their computers and record new ideas and delete ones that did not work out the first time. If they were using a paper and pen, the ease of recording and deleting would be much more time consuming. Most importantly, these organizers let students access their preferred style of learning or type of intelligence, express and exchange their discoveries with their peers, comprehend the big picture through smaller representations, and see results quickly (Galavan & Kottler, 2007).

Programs such as *Inspiration* can be used in multiple ways, for instance, as a tool for organizing information before writing and as a way to construct a brainstorming map with the whole class (Smith & Okolo, 2010). Teachers, once trained, can use this program, and ones similar to it, with their struggling student(s) to create a digital organizer. The students can manipulate the program, add and delete information, and make the program their own. The use of visual graphics, images, and other icons can further contextualize what the writer is trying to say and enhance vocabulary, structure, and the quantity of writing (Smith & Okolo, 2010). Programs like *Inspiration, Kidspiration, Webspiration, FreeMind, Mind Domo,* and *Draft Builder* allow them to create their own, unique organizers. "When students with LD use technology-based tools to plan assignments, brainstorm ideas, take notes on textbooks and lectures, synthesize information, and self-test their knowledge, their text comprehension and test performance improve" (Smith & Okolo, 2010, p. 262.). Struggling students need to take the time to plan their writing out. Using a digital organizer, the students have the ability to control their ideas, erase mistakes in typing

or organizing ideas more easily and make visual connections between ideas. Regardless of the program used, some form of digital organizer is helpful in planning out a piece of writing for a struggling writer.

Technological Applications in Drafting Stage

Struggling writers need help in composing their pieces. Handwritten pieces for classes are time consuming and taxing to many students, not just struggling ones. Technology removes this taxation and allows the students a more flexible format in which to write. Their ideas are easily manipulated, corrected, and improved. In this section, evidence from the research that technology enhances students' drafting stage is discussed. MacArthur (2009) notes that word processing, spelling checkers, and speech recognition offer support for transcription and revision. Capitalizing on these available tools for the drafting stage is the focus of this section of the review. Quinlan (2004) states that typing for word processing may impose less transcription load on text generation, other things being equal, because typing involves simpler graphemic processing and motor sequences. Peterson-Karlan, Hourcade and Parette (2008) echo Quinlan (2004):

> In traditional handwritten drafts, students may become overly conscious
> in their attempts to produce legible handwriting and mistake-free
> spelling. This effort comes at a significant cost, as they then may lose
> track of their basic ideas, supporting details, and logical sequences
> to be conveyed in their writing. The result is poor quality writing. (p.19)

All of these researchers come to the same conclusion with using technology; it helps the students overcome writing issues by hand and allows them the chance to write unhindered. Students who struggle with pen and paper finally have an opportunity to express their ideas using a computer they did not previously have. In a study of children ages 11-14, Quinlan (2004) used a writing workshop that utilized speech to text software to find out how successful the technology would be on students who struggled with writing. Quinlan used a six-hour writing workshop where the students learned how to use the speech recognition program and composed four pieces of writing. The writing consisted of one handwritten piece, one used the speech recognition software, one with a brainstorm exercise and speech recognition, and one without the brainstorming and with speech recognition. Quinlan found narratives handwritten by less fluent writers were rated significantly inferior to the handwritten narratives of fluent writers in terms of length, quality, and surface errors. In addition, the narratives composed by less fluent writers using speech recognition had significantly more words and fewer errors than their handwritten narratives. In this study, Quinlan showed that when struggling students use speech recognition in the drafting of pieces, the quality of their work improves. The errors in spelling went down and length of the pieces increased when the students used the speech recognition software. Teachers can take this information into their classrooms and use this technology with their students that struggle with composing pieces. As Quinlan showed, this will help these students produce better quality writing.

A study of 110 students labeled LD by Wollak and Koppenhaver (2010) looked at getting students that struggled with writing to enjoy the act of writing by using e-mails. In their study, Wollak and Koppenhaver had the students pair up with undergraduate college students studying to become teachers. The struggling writers followed steps of beginning the e-mails with salutations, answering questions posed by their e-pals, asking questions of their e-pals and signing off with a proper ending. The researchers found that the students involved began more carefully crafting their e-mails, one student doubled the length of e-mails from 30-40 words per e-mail to 80-90 words, as well as doubling the length of words in the sentences written. The students in the program reported enjoying writing the e-mails. They followed the steps in planning and drafting their letters and began revising their correspondences. The researchers noted that the gains made by the students within program could translate into a classroom. The teachers could build off of the gains made by the students in this program and show the students how to take their writing into other subjects and find similar success.

Englert et al. (2007) conducted an experiment using a web-based scaffolding condition compared to a paper and pencil condition that involved 45 eighth graders identified as learning disabled. Twenty students used the web-based program and the other 25 used pen and paper. Students in the web-based group used a program called TELE-Web (Technology-Enhanced Learning Environments on the Web). This program prompts students to generate specific ideas and details while writing. The goal was to see if there was a difference in writing length and quality between the two

groups. Englert et al. found that students that used the TELE-Web program developed longer pieces than those that used paper and pen. They noted that TELE-Web seemed to allow students to offload some of the strategic requirements of the writing process onto the machine. This freeing of requirements needed allowed the students more energy to type and formulate ideas more easily. They also found that technology served a mediating function that helped students with disabilities perform in a qualitatively superior way. Students, especially struggling ones, have more time freed when it comes to assembling thoughts on a digital screen than they do actually transcribing the same ideas on paper.

Wolfe, Bolton, and Feltovich (1996) studied 104 tenth-grade students from several schools. The authors looked at how students used word processors versus writing with pen and paper. They found that "students favor writing with a word processor when their writing will be read for informative or evaluative purposes, such as a writing assessment" (p. 280). Students come to classes today are equipped with knowledge about computers and many of them prefer using computers as compared to pen and paper writing. Yet, even students who do not have familiarity were found to be able to make corrections while drafting their pieces. "Students who do not have adequate computer skills realize their difficulties and are able to correctly assess which composition medium will produce better writing for them" (Wolfe et al., 1996, p. 280).

In a study of 31 high school students, 21 of which were classified as LD, MacArthur and Cavalier (2004) sought to examine the effects of speech recognition

on composing a piece of writing for a test. The authors found that students that used

the speech recognition software produced better written work and made fewer errors

than if handwritten. Quinlan (2004) suggests that writing tools that reduce

transcription load should benefit children with writing difficulties because such tools

leave more working memory resources available for the text generation.

   Although a word processor with a spell checker is a powerful tool, some

students with LD can benefit from additional support in producing text accurately and

fluently (MacArthur, 2009). "Speech recognition software offers the possibility of

composing by dictation without the assistance of another person" (MacArthur et al.,

2001, p. 23). Being able to speak to a computer, and have that computer type, is yet

another tool struggling students may employ. Students using speech recognition

software are provided with a visible representation of the developing text (Quinlan,

2004). Students are able to make changes quickly as they craft the piece which allows

them time to write. MacArthur (2009) comments that struggling writers produced

better texts in both dictation conditions than with handwriting, showing the

importance for them of removing the difficulties caused by transcription. Students that

struggle with typing may use these programs and produce a higher quality writing

piece than if they had to slowly type out the same thoughts. The speech recognition

software frees them of this struggle and allows them to focus on what they are trying

to get across. MacArthur et al. (2001) indicate that students who used speech

recognition software showed improvement on standardized measures of spelling,

word recognition, and comprehension opposed to students who used only a word processor program.

A study on the program Writing Matters, conducted by Goldenberd, Meade, Cooperman, and Midouhas (2011), sought to evaluate the effectiveness of a middle school writing program that incorporates the process-oriented model along with technological supports, professional development, and study units of various writing genres. Writing Matters is a computer program with technological supports such as animations, samples of student writing, and online exercises that allow students to share ideas. Using 371 students from seventeen classes, the researchers compared Writing Matters to a traditional writing workshop class. They found that students who were exposed to Writing Matters over a school year did not make gains in writing ability or gains that differed from students who were not exposed to Writing Matters. However, the students with the lowest initial writing ability who were exposed to Writing Matters over the year did make significantly greater gains than those with the lowest initial writing ability that were not exposed to Writing Matters.

Another idea to employ to help students draft is to have the students create a graphic novel as Lawrence, McNeal, and Yildiz (2009) did in their study. The students crafted the stories together and then drew appropriate pictures that went along with the dialogue in the graphic novels using the program Comic Life by Plasq. Much like digital stories, these graphic novels empowered struggling writers to explore a new multimedia approach to express their ideas. The students were asked to create four projects: An individual comic, a group research project and informational

comic strip, an individual reader response project, and an individual book critique.

Students used cameras to capture pictures to use and drew on a computer using the

aforementioned program to enhance the stories they were writing. Lawrence, McNeal,

and Yildiz found that LD students were able to increase their understanding of

communicating with texts and visuals, to develop their writing by synthesizing

informational text, and to increase their knowledge of technology. From these

findings, the authors show how teachers may use technology in new and engaging

ways to help promote the writing of those who struggle.

   The resources to help students write using technology are plentiful to teachers.

The biggest impact comes from the speech recognition software as shown by the

aforementioned studies. In each case, students produced better written work with

fewer grammatical and syntactical errors. As MacArthur (1999) notes, freeing the

struggling students from the burden of transcribing helps them focus on the task of

writing, the craft of composing some piece of written work. By giving the students an

outlet where they may find success in composing, the students learn how to put a

story together.

   Training students how to use a speech recognition program does provide a

potential challenge. It takes time for the computer to '"learn"' the speaker's voice and

the speaker needs to learn to speak clearly (MacArthur, 2009). This may prove to be

too much of a struggle if the student has speech problems. Also, finding a small space

that is quiet enough for the student to speak to the computer may be a challenge. In

most classes, a student will not be able to use this program while class is in session;

the volume of the student will certainly interfere with other students.

MacArthur (2009) comments that, in just 25 years, we have progressed from

the first computers useful for word processing in schools to e-mail and Internet

searches to Web 2.0 applications that support easy creation of Internet content by

users. Word processors have come a long way in a short amount of time. Students

now have more options available in the programs than in previous versions. Teachers

still need to teach their students how to use the programs, how to correctly access the

programs to get the most of the piece of technology regardless of what that is. Some

students may struggle with a word processor simply because they do not know how to

type.

Technological Applications in Peer Editing and Revising Stage

Graham, MacArthur, and Schwartz (1995) state that for a variety of reasons,

students revise infrequently or concentrate their revising efforts on proofreading. The

third step in the writing process is editing and revision. Teachers can go beyond the

underlined misspelled words identified by spell check. They can incorporate

technology to help guide student activities that make use of the technology to teach

why revision is important and how to better revise writing pieces. Graham et al.

(1995) point out that students with learning problems are even more likely than their

normally achieving classmates to view revising as proofreading.

Bonk and Reynolds (1992) studied middle school students and first-year college students using word processors. For the middle schools students, the researchers found no effects on revisions or on the quality of the essays produced. Yet, with the first-year college students, they found that those who used a word processor made significantly more revisions and earned higher quality ratings from their teachers.

Midgette, Haria, and MacArthur (2008) studied the effects of revising goals focused on content and audience awareness on the persuasive writing of fifth- and eighth-grade students. They used 181 fifth- and eighth-grade students from public schools. This large group was broken into three groups and students were randomly assigned to three different goal conditions: A general goal; a goal to improve content; and a goal to improve content and communication with an audience. The researchers found "that audience awareness goals were, in fact, effective in leading the students to consider opposing perspectives" (p. 142). When the students were focusing on the meaning of the text, and the strength of the persuasiveness, their revisions were much better. When the students focused on the meaning of the writing and not just grammatical mistakes, they went deeper with their revisions than just surface corrections. By breaking the students up into these three groups, the researchers showed that specific goals of revising helped direct the students to make more meaningful revisions on their peers' work. The first group, the general goal, made minor revisions, whereas the other two groups made more meaningful revisions.

Studying the effects text-to-speech programs like *Kurzeil 3000* has on revising, Conrad-Salvo and Spartz (2012) found that technology used with teachers (tutors) yielded the best results in revising work. The students in the study enjoyed listening to their papers and could more readily identify errors present in their papers. However, it became very apparent that tutors trained on using *Kurzweil 3000* were as necessary as having the students use the program. The researchers found that students using the program and the tutors were more apt to make meaningful improvements on their papers than the students who just used the program. Teachers who fear replacement by technology should take solace in this study as it showed that trained professionals are needed with the technology.

MacArthur, Ferretti, Okolo, and Cavalier (2001) suggest that word processors may encourage struggling students to manipulate their own work as it appears on the screen, rather than revising a handwritten piece which is a cumbersome task even for students who do not struggle with writing. Again, beyond mechanical corrections, students reread their ideas and manipulate them to keep the theme central, or to revise the meaning of areas that are unclear. MacArthur, Graham, and Schwartz (1995) showed that a sample of 12 LD students made greater gains in the quality of meaning in their writing and information than did students in ten control classes that did not use computers.

Effectively using the spell checker option on a word processor can be beneficial for struggling writers as well. As noted by MacArthur, Graham, Haynes, and De La Paz (1996), middle school students with LD who had moderate to severe

spelling problems corrected 37 percent of their errors with a spelling checker,

compared to nine percent using a word processor and printout without a spell checker.

MacArthur, Ferretti, Okolo, and Cavalier (2001) note that spell checkers improve

spelling in students' written compositions. Spell checkers have limitations in that they

often miss homonyms or closely misspelled words to typos made by the writer (e.g.

'form' instead of 'from') (MacArthur, 2009). Spell checkers are ideal for misspelled

words that are closely spelled to the intended word. In some cases, the spell checker is

rendered useless due to the severity of the misspelled word (MacArthur, 2009). Even

with these limitations, spell checkers are useful to students. The immediate feedback

of misspelled words provides students with a prompt to rethink their ideas or to pay

closer attention to what they are attempting to get across.

Cho and MacArthur (2011) note that peer review of writing provides an

alternative to the traditional approach of practicing writing with feedback from an

instructor. Horton, Rogers, Austin, and McCormick (1992) suggest the strategy

whereby groups of students work together to craft pieces. In their study, first-year

undergraduate students used a program (Capture Lab) where each student had the

ability to add ideas, sentences, to a board that displayed their group effort. The

students were categorized as just "above struggling." Horton et al. found that these

students needed training on how to work together effectively. Some students found

the ability to revise and edit, with the entire group, was too distracting. They

concluded that "groups who need or want to work face-to-face, dividing the task and

working individually some of the time may yield better-quality results than working

exclusively as a group, as our comparison of groups' work patterns suggests" (Horton et al., 1995, p. 19). This idea can be applied, or modified, by teachers wherein they have their students work independently on their pieces with laptop computers and then come together, revise, and craft one single piece. In this way, struggling writers would see how revision works to sew many pieces together to form one single voice. While Horton et al. may have found difficulties with the grad school students working together, the struggling writers will find the communal effort worthwhile. Working with effective writers, struggling writers will see good writing skills modeled for them that they incorporate into their own writing.

Another technological application for revising is using sentence-combining with peer assistance. In their study, Saddler, Asaro, and Behforooz (2008) paired students classified as struggling together to work on sentence combining skills. The students started off with kernel sentences and worked to expand these sentences by combining similar ideas. The authors devised a digitized peer editing checklist for the students to use when it came time to write their original stories. This checklist "increased their ability to identify the use of sentence-combining skills in each other's writing and make effective revising suggestions as they progressed through the intervention" (Saddler, Asaro, & Behforooz, 2008, p. 13). Regardless of class size, teachers may find this approach useful, especially with the peer revision aspect. This technique shows struggling writers how effective writers through revision and sentence combining skills effective writers possess.

Technological Applications in Publishing Stage

The final stage to be covered in this review is the publishing stage. Here, teachers can take good advantage of the technology in their rooms by showcasing the writing accomplished by their students and by giving them immediate feedback. Wikis, blogs, PDFs, webpages, and are just some of the ways teachers can disperse their students' work electronically (Boone & Higgins; 2003, Dishaw, Eierman, Iverson & Philip, 2011; Sylvester & Greedidge, 2009; Victor, 1999).

"By using a blog for discussion purposes, students can think through their thoughts, get feedback, and use their peers' constructive comments to improve their writing" (Sweeney, 2008, p 8). Blogs, and blogging, is relatively new in terms of technology. More and more teachers are taking advantage of this new literacy to promote effective writing strategies. Sweeney (2008) advocates for the use of blogs because of the direct feedback students can give each other. In addition, she calls for the use of a student created wiki for collaborative writing. The teachers control the wiki and are able to keep it focused as the students offer ideas, thoughts, and ask questions (Sweeney, 2008). In an initiative entitled "The Talkback Project," Wittle (2007) used her classes of middle-school students to blog about books with college students who were studying to become teachers. She found that her middle school students were eager to communicate their ideas with the soon-to-be teachers, and they would actively engage in idea sharing using the blogs. Using this technology, Wittle (2007) found that the middle school students were more excited to write and

communicate by way of their blog, and were eager for a response to their thoughts and ideas.

McGrail and Davis (2011) studied how blogging influenced student writing development at the elementary level. They used sixteen fifth-grade students from a southern state. The authors did not mention if the students used were classified as LD or not. McGrail and Davis found that when the students began to write for an audience beyond their teacher, their writing styles began to improve. "As bloggers, these students were learning to write in the readerly way, by attending to their readers' needs and interests" (p. 432). The students began to write with the idea that their audience was reading their works for meaning, to post questions and comments back that would further their topic. They stopped writing for their teacher. The student's intention, their purpose for writing, stopped focusing on the grade for their accuracy with grammar and meaning. The students revised their work and paid close attention to the meaning they were making and paid attention to how effectively they were putting their ideas out to their intended audience. That is the idea with using blogs as a publishing tool, students can get instant feedback from audiences who either agree or disagree with their ideas. From this publishing, more threads of communication can occur, which can deepen the meaning of the writing experience for the writers as it did in this study by McGrail and Davis (2011).

Lin and Yang (2011) studied the effects of using Wikis with 32 high school sophomores. The authors did not classify the students as "struggling." The authors found that as the students published their work on the Wiki sites, they started learning

mechanics and sentence structures from one another's posts. The students went

beyond what the teacher was covering in class as they read each submission. As one

student said, "They will find out which part of my grammar is wrong which I do not

figure out…" (Lin & Yang, 2001, p. 95). In this study, it was found that the students

became the accidental instructors and helped one another with material the instructor

and researchers were not expecting the students to cover.

Ma and Yuen (2008) studied the impact Wikis have on student work in a

journalism class. Wikis are pages that can be quickly modified, edited, and

reformatted by the users. In their study, Ma and Yuen used 526 undergraduate

students. The students set up a wiki page to support undergraduate journalism

students learning news writing. Ma and Yuen found that more than a third of the

students involved in the study found the Wiki creation and use to be helpful. They

were able to easily access the Wiki, post topics, answer other topics, is a good source

of knowledge and read other articles by peers easily. The idea of easily sharing their

ideas was the heart of this study, students wrote, and published, ideas with the goal of

expressing knowledge on a topic. Similar to the study by McGrail and Davis (2011),

the students wrote for each other, not for the teacher, and the writing improved the

more they used the Wiki.

Professional Development

This project is written to show teachers how and why they should utilize technology in their classrooms. Teachers, entering a professional development setting, bring with them expectations. According to Oja (1980), teachers want concrete experiences used in the workshop they may then replicate, available supervision, encouragement to take on complex roles and support and feedback when using new techniques. The role for any professional development has to be to add new techniques or ideas to a teacher's repertoire. Teachers also bring with them tensions. Wilson and Berne (1999) noted,

> Admitting that you have done the wrong thing in the past
> or do not know the subject matter you teach is unsettling. Yet,
> professional development designed to help teachers acquire new
> professional knowledge, especially subject matter knowledge
> can often involve just that. (p. 200)

The purpose of professional development workshops should not be to highlight areas of weakness of the attending teachers. Rather, it should be an encouraging session where teachers learn new topics, techniques, and skills to bring back into their classrooms. It is the role of the facilitator to ease these tensions and focus on the lessons to be learned. The skill of the facilitator will be to not simply lecture the audience, but to get them involved in the lessons and knowledge to be covered. In a study of 18 teachers, Nipper et al. (2011) studied the reactions of the participants when the instructor simply lectured the audience. The teachers reported negative feelings about this and did not gain much useful information from the

session. They felt frustrated that they were not able to interact with other teachers. While the sessions continued, the instructor lectured less and had the attendees do more hands-on activities and share their results. This tactic engaged the teachers more and they reported feeling better about the session, that they felt they learned more from working with one another. Warford (2011), using Vygotsky's socio-cultural theory, states that teacher trainers cannot promote the learning of teachers without tapping into their previous knowledge and experiences during the training. Just as teachers aim to focus their students into their own prior knowledge, the instructors of professional development sessions should attempt to do the same. At the same time, as Desimone (2009) points out, teachers must be willing participants, otherwise the session, much like a classroom of uninterested students, is a waste of time. Lawrence and Chong (2010) point out, interestingly, that colleagues, through co-operation during a professional development session, feel a stronger sense of togetherness. The implications here lead to a better work environment, a faculty that works well together, willingly, may receive more information from a session than a school where the teachers do not feel such a strong sense of togetherness. Focusing on this whole-team development, faculty with a higher level of co-operation are more likely to be more receptive to an instructor and take the lessons learned back into their classrooms.

Taking into account all of the anxieties and expectations, this professional development portion of the project will try to give the teachers real examples to take back into their classrooms. The goal of the professional development section is to provide a useful road map, of sorts, for teachers to use as they are able based upon the

technological limitations of their rooms. As Confessore and Confessore (1994)

caution, the courses, now mandated and institutionalized, turn from actual learning to

teachers simply counting credits for their yearly development need.

Conclusion

Why use technology? The studies in this chapter all point to reasons why

technologies are necessary in the classroom. Today students enter the classroom with

an ability to use technology that is greater than it was five years ago. They come with

this knowledge because they have grown up in the digital age. The literature suggests

a wide use of computers and technology that impact the writing of struggling writers

in beneficial ways and it encourages teachers to embrace these technologies. Each

phase of the writing process can be positively impacted by the use of technology.

Training teachers how to implement computers in each phase will be the focal point

of the remainder of this project.

Chapter Three Methodology

Data Collection

Literature related to the topic of technology and struggling writers was collected through a search of the following databases: ERIC, EBSCO, Academic Search Complete, Computer Database, Education Full Text, FirstSearch, and Teacher Reference Center. The search terms used for the search included *Technology, Graphic Organizers, Brainstorming, Struggling, Adolescent, Classroom, Peer Editing, Drafting, Review, Peer Review, Writing, Professional Development,* and *Adult Learning Theory.* Only studies that specifically addressed technology used with struggling writers were included in the literature review. Several articles were excluded as they did not meet the age requirement I set in my research questions. Other articles were not used as they dealt with subjects outside of the United States. I narrowed the searches down to include the topic with *technology*. Since I teach at the secondary level, I decided to focus on this age group through the literature review. As well, I work with students who struggle with writing and wanted to keep that demographic as my target audience. My considerations for the literature review dealt with technology and its impact with struggling adolescent writers. I focused on studies that showed the impact that technology had upon these students while keeping an eye towards developing strategies teachers can use in their classrooms in terms of using the technology.

Data Analysis

      I divided studies by their relevance to Pre-writing, Drafting, Editing and

Publishing stages. A few of the studies dealt with multiple topics and I saved them

into the applicable folders. To organize the studies, I came up with the categories as

they coordinated with the process of writing such as organizing, drafting, editing, and

publishing. While I analyzed the literature, I grouped the articles in the subfolders

together based on the similarity of the themes of the studies. I tried to keep the review

moving in a cohesive manner and grouping the articles with as much similarity

seemed to make the most sense. I grouped similar studies and transitioned between

studies that were not similar in strategy, yet still focused on how technology impacts

the writing process for that particular stage.

      The intended product of this project is a workshop designed for teachers of

middle school and high school students. The purpose of the workshop is to help these

teachers more effectively use the technology they have in their room to engage their

struggling students. Using the research gathered in the literature review, I will focus

on the documented ideas and tools that have shown an impact on the writing.

Chapter Four Professional Development

Design of Professional Development Workshop

The goal for this workshop is to inform teachers of the current research on using technology with struggling adolescent writers to enhance the writing process, and to demonstrate evidence-based technology use in classrooms with adolescent struggling writers during a one-day in-service. The participants are to be writing teachers, pre-service teachers, literacy coaches, department heads, principals, and any other faculty member interested in using technology to help improve students' writing. If the attendees have laptop computers, they will be encouraged to bring them. The computers will be used during the day; however, teachers who do not have computers will not miss out on activities. They may look on with a colleague and/or take notes on the programs discussed and the strategies covered. The seminar will be held during the school day. The plan for this day can be found in Appendix A.

Wilson and Berne (1999) posit that teachers bring tensions into whatever workshop they attend. Technology, in general, has the power to make people feel inadequate, and can be a great source of tension for teachers. This workshop will focus on how to help the attendees better incorporate technology into their classrooms rather than point out what they do not know. The first step in this workshop will be to emphasize how the attendees are already using technology. They will be asked to hold up their cell phones with an aim to see how many have smart phones. Oja (1980) states that teachers want to bring back ideas/pieces of information from workshops into their classrooms. The teachers involved in this workshop will be given many

chances to use the technology they will bring into their classrooms. This is important

so that the teachers become familiar with programs they may not have ever used, as

well as strengthens their understanding of programs they are somewhat familiar with.

Technology is an area that causes the most amount of stress in teachers as

many may not know how to use what they have in their rooms appropriately. My first

objective will be to ease their anxieties that this will not be a day-long seminar on

areas they have used technology incorrectly. The day will begin with a brief overview

of the project, why the topic is chosen and what the attendees can expect from the

day. I will cover the basic expectations of the day that the teachers will be asked to

participate in the group sessions and be encouraged to ask questions of each other and

of me. The objective for this workshop will be to demystify technology and to show

its impact with struggling writers. However, it will be explained that technology is not

the silver bullet. The implementation of technology by teachers yields the impact,

noted by Larson (2006). The solution is not simply giving a struggling writer a piece

of technology.

Before the sessions begin, a brief discussion of struggling writers will be held

to get the audience together on what makes a writer a struggling writer. The first

session will begin with a brainstorming discussion on how the teachers in the

audience incorporate technology into their classes while working on writing. We will

first start with discussing pre-writing and why teachers find it important. As well, the

teachers will describe how their struggling writers brainstorm and what they, the

teachers, do to help improve the quality of brainstorming. I will share the findings

from research regarding special needs of struggling students at this stage. The

audience will be asked what programs are in use in the classrooms for pre-writing, if

any. Based on Wang and Dwyer's (2004) study involving concept mapping, I will

explain why programs like *Inspiration 9* are likely to have an impact on struggling

writers.

This will lead into hands on use of the program *Inspiration 9* (Appendix B) by

the audience. I will show them how to set up the program, how to create bubbles, how

to arrange the bubbles. The teachers will then use the program, either in pairs or as

individuals, to brainstorm a response to the topic, "What do I like about writing?" The

goal for this is to have the attendees use the program, to become familiar with it and

to see the applications for their students. We will end the session discussing what the

audience likes about the program and what they do not like about it. As well, we will

discuss how the attendees can incorporate the program into their class. This section

will end with a discussion on the ease of use of these programs instead of using pen

and paper to organize thoughts and ideas. Freeing struggling writers from the burden

of writing ideas down and moving them into an easier format will be the focal point of

this discussion and the benefits of doing so.

The next session will start with a discussion on drafting and how the teachers

use computers in this step of the writing process. Again, we will keep the idea of

freeing the students from having to handwrite their pieces and showcase the obvious

impacts technology has on writing. I will discuss findings on using speech to text

software, with the mention that this is only one of many ways to help students draft

work with computers. I will cover the use of speech recognition software and its impact with struggling writers. I will show how technology impacts the writing stage, that it is simply easier for writers to type their ideas rather than handwriting pieces. The teachers will then use the speech to text software on their computers. Using the *Inspiration 9* brainstorm, the teachers will then dictate their paragraph response. As before, we will discuss as a group the likes and dislikes of using speech to text. We will also discuss how teachers think they can use this program within their classes. At the close of this session we will break for lunch for a half an hour.

Upon the return from lunch, the focus of the sessions will move to peer editing with computers. The audience will be asked how they have their students peer edit in their classes. We will discuss how to set students up for successful peer editing. The difference between editing and proofreading will be discussed to ensure the teachers have a clear idea of the difference between the two.

The teachers will then have a chance to peer edit one another's paragraphs using the computers the stories were typed on. The teachers will switch computers with a partner. We will then discuss likes and dislikes of have students peer edit using the computers, and how the teachers could implement the computers in their classes.

The final segment will involve the use of blogs as a form of publishing the pieces crafted by their students. We will discuss, as a group, if any of the audience uses blogs in their rooms and why they use them. We will discuss the idea of having students write for the purpose of sharing their ideas with a crowd larger than just the teacher, and what that added audience could do for the writers.

Using Edublog.com, the teachers will create their own blog account and publish their paragraph. The teachers will then look around the site for the other member's blogs and leave comments on the pieces published. We will close the session discussing the feasibility of using blogs in the classrooms.

The session will come to an end with a reflection of the day's work. The teachers will be asked to mention one thing they learned, or one thing they may want to try in their class. Using Surveymonkey.com, the audience will be directed to the following link (http://www.surveymonkey.com/s/LMRNVZN) and asked to complete the survey based on the seminar. The survey can be found at the end of this project in Appendix C.

IRA Standards, relevant to the workshop discussed, follow this section and conclude this chapter.

Table 1

IRA Standards Matrix

IRA Standards	Components Addressing Standards
1.1 Inform other educators about major theories of reading and writing processes, components, and development with supporting research evidence, including information about the relationship between the culture and native language of English learners as a support system in their learning to read and write in English.	The candidate addressed this standard by writing this project aimed at teaching colleagues on how to better use technology in their classroom to help struggling writers.
2.1 Demonstrate an understanding of the research and literature that undergirds the reading and writing curriculum and instruction for all pre-K–12 students.	The candidate addressed this standard by researching empirical research that studied how to implement technology to enhance struggling students' writing in a classroom.
2.2 Support classroom teachers and education support personnel to implement instructional approaches for all students.	The candidate addressed this standard by creating the professional development piece within this project to focus on instructional approaches
4.1 Assist teachers in developing reading and writing instruction that is responsive to diversity.	The candidate addressed this standard in writing this project, keeping in mind that the students used in the studies came from diverse backgrounds in urban schools. As well, bringing in the student's varying technological skills to help one another, in the revising stage, addresses this diversity.
5.2 Create supportive social environments for all students, especially those who struggle with reading and writing.	The candidate addressed this standard in using the social constructivist theory of education using the theoretical framework of scaffolding and setting up students for success. As well, the professional development addresses this standard in that the candidate will show teachers how to support their struggling writers and help them improve their writing.
6.1 Use the research base to assist in building an effective, school wide professional development program.	The candidate addressed this standard by creating the professional development piece within this project.
6.2 Demonstrate effective use of technology for improving student learning.	The candidate addressed this standard by researching and crafting this thesis project designed to show teachers how to better use technology to enhance struggling students' writing in their classroom.

Chapter Five Conclusion

Overview of the Study and the Findings

The findings from the literature review on the four stages of the writing process, while using pieces of technology, highlighted how and why technology should be incorporated into every classroom. Strategies teachers could use to better incorporate their students' ability to use technology were also covered. Future research possibilities and limitations on the research will be further addressed in this chapter.

Significance of the Findings

The biggest piece of information gained was that technology itself is not the magic cure for writers who struggle. Simply placing them in front of a computer does not "cure" them. Teachers still play a vital role in helping their struggling writers. Though students today come to class well educated with the uses of technology, the teacher is still the one that provides the most help. Teachers need not be fearful of being replaced by technology. They should, instead, embrace its advantages in their classroom. The first simple truth is that the burden of transcribing work by pen is gone with technology. It is easier for struggling writers to type their words on a word processor. As they craft their pieces, the students get a direct feedback from the computer screen that aids in comprehension. The entire writing process, from brainstorming to publication, has been drastically altered by the introduction of

technology. From typing to speech-to-text programs, teachers and struggling writers have a wealth of aids at their fingers. Struggling writers bring many needs with them to the classroom. As found in the research, many of these writers lack the skills of good writers, the ability to plan out pieces, modify pieces and get ideas across in strong, effective ways.

Both technology and teachers play a role in helping these writers overcome many of the needs they have. First, students using programs like *Inspiration 9* can visually plan out their pieces and see physical connections of ideas that translate into connections in the written piece. Using speech-to-text programs, those who struggle with typing are able to get their ideas across without the burden of writing them down on paper. While editing, students can listen to their work with text-to-speech programs like *Kurzweil 3000.* Finally, students can see how their writing affects larger audiences when they publish their work to the web through Wikis or blogs. They begin writing beyond their teacher, especially when others take notice of their work and comment on the ideas. When incorporating technology into the writing process, struggling writers will find the most impact. Troia (2006) showed that struggling writers do not take the time to plan out their pieces, instead they just start writing. Using concept mapping programs, like *Inspiration* 9, students have the chance to easily organize, and quickly manipulate, their ideas to strengthen their thoughts (Brodney, Reeves, & Kaselskis, 1999). In the drafting stage, struggling writers can take advantage of speech-to-text software to reduce spelling and mechanical errors (MacAurthur & Cavalier, 2004). If teachers set clear revising goals, students,

struggling or not, can be very successful with peer editing (Midgette, Haria & MacArthur, 2008). In the publication stage, the use of blogs can show the students writing is more than just getting a passing grade from a teacher. The students, again those who struggle and those who do not, see an audience beyond a grade and focus on writing for a greater audience (Wittle, 2007).

Future Research

More studies on using iPads into the classroom would be a great place for researchers to pick this project up. Other tablets like Kindles and their impact with struggling writers would also be another area to research. Using technology in other ways is also an area that has few pieces of research. "Flipping the Classroom" and its impact on struggling writers needs more research done. Finally, a more clear definition of what a struggling writer is, and how a student is classified as struggling, is needed.

Conclusion

The purpose of this project was to research what impact technology has on struggling writers. It was found that the impact can be amazing if the technology is used correctly by trained people. Simply throwing computers around does not solve anything. Students need to be taught by trained professionals how to effectively use the computer, the word processor or the speech-to-text program. Reviewing the research shows that technology can have a great impact on the students. When used in

the writing process, struggling writers can better organize their ideas, revise, and

publish their pieces. They have a chance to write pieces that more accurately represent

their ideas than if they were to write with a pen and paper.

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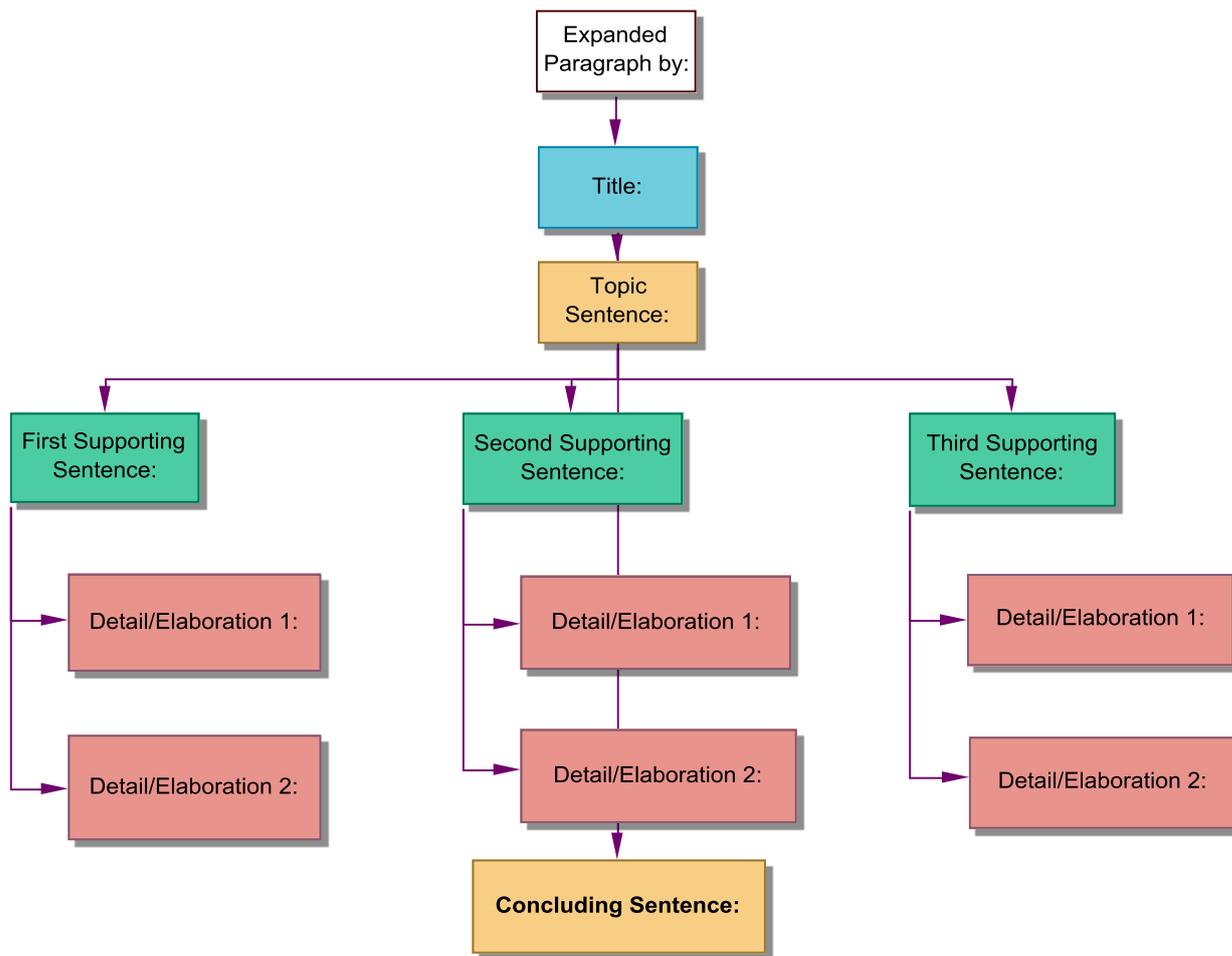
APPENDICES

Appendix A

Professional Workshop Plan

Time	Activity
9-9:30	Brief overview of project, findings and review of the planned events, what a struggling writer is, what their struggles are and why technology may help them.
9:35	Brainstorm session. What do teachers know about Pre-writing? What technology is available to them currently? How are they using technology in their classes already?
9:40 9:45-10:30	• Focus on Pre-writing/Organization o *Inspiration 9* • Introduction to the program, how to use it, focus on feature of the program • usefulness from the literature • Teachers use the program at the computers • Create a graphic organizer on the topic of 'What I want for Christmas' • Discussion • What did teachers like? What did they not like? • How could they use this in their classes?
10:35	Brainstorming. How do teachers use technology in drafting pieces? What technology is available to them?
10:40	• Focus on Drafting

10:40-11:30	• *Speech to Text Software*
	    o On the same computers as before, teachers will use the
	       Speech Recognition software
	• Introduction on how to use the software, how to set up the program
	• Share research findings on impact of technology
	• Teachers will use the program to write out the brainstorming Christmas exercise into a paragraph.
	• **Discussion**
	• What did teachers like/dislike and why
	• How could they incorporate this into their classroom?

11:30-12	Lunch
12:05	Brainstorming. What technology do teachers use with peer editing? How do they peer edit with technology?
12:10	Focus on Peer Editing
12:10-12:50	• Teachers will discuss useful ways to peer edit, focusing on setting targets and goals for students to meet

	• Teachers will use the drafts constructed earlier and peer edit with a partner using the computers on which they drafted their pieces • Share research findings on impact of technology • **Discussion** • How can teachers best set students up for success with peer editing? • How would they employ digital peer editing in their classes? • Is this a viable option for their classes? Why/Why not?
1:00	Brainstorming. How do teachers use technology in the publishing stage?
1:05	Focus on Publishing
1:05-1:50	**Blogs and Wikis** • Teachers will review what Blog and Wikis are • They will create a blog and post their Christmas story using Edublog.com • They will review each other's blog and leave a comment if they feel • **Discussion** • Share research findings on impact of struggling writers • Usefulness of blogs and Wikis in a class will be discussed • Positives and Negatives of each will be addressed • Is this something the teacher would use? Why/Why not?
1:55-2:30	**Wrap Up** Teachers will reconvene and discuss the day's work What was a highlight? What do they feel they can take into their classrooms and why? Are there other forms of technology they could use? What would those be? Do a survey to evaluate the effectiveness of the workshop.

Appendix B

Inspiration 9 **Digital Graphic Organizer**

```
                        ┌──────────────┐
                        │   Expanded   │
                        │ Paragraph by:│
                        └──────────────┘
                               │
                        ┌──────────────┐
                        │    Title:    │
                        └──────────────┘
                               │
                        ┌──────────────┐
                        │    Topic     │
                        │  Sentence:   │
                        └──────────────┘
```

First Supporting Sentence:	Second Supporting Sentence:	Third Supporting Sentence:
Detail/Elaboration 1:	Detail/Elaboration 1:	Detail/Elaboration 1:
Detail/Elaboration 2:	Detail/Elaboration 2:	Detail/Elaboration 2:
	Concluding Sentence:	

Appendix C

Professional Workshop Exit Survey[i]

1. What was the most important thing learned today?

2. Was there an area that is still unclear? What would that be?

3. On a scale of 1 to 4, 1 being the lowest and 4 the highest, how would you rate this workshop in its effectiveness? Why?

4. How ready are you to try some of the suggestions from the workshop?

5. Any additional comments to add?

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[i] Note: This survey was developed at www.surveymonkey.com