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Using PowerPoint created talking books for reading fluency instruction

Gretchen R. Lawyer
University of Northern Iowa

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Using PowerPoint created talking books for reading fluency instruction

Abstract

This paper describes action research integrating Microsoft PowerPoint with reading fluency instruction in a group of 6 first grade students. Included is a literature review examining multimedia, hypermedia and reading fluency. Students used CD-ROM storybooks as models for reading fluency, received direct fluency instruction, and wrote stories they developed into "talking storybooks" with Microsoft PowerPoint. Results showed students improved overall reading fluency, except reading rate. Expression and prosody were most positively affected.

A rating scale measured student attitudes towards the instruction. Results showed a positive reaction. In addition, it was found that students might have been indirectly motivated by the technology. The study concluded using PowerPoint created talking storybooks was an effective integration strategy for reading fluency, writing, and technology.

USING POWERPOINT CREATED TALKING BOOKS
FOR READING FLUENCY INSTRUCTION

An Abstract of A Graduate Research Project
Submitted to the
Division of Educational Technology
Department of Curriculum and Instruction
In Partial Fulfillment
Of the Requirements for the Degree
Master of Arts
UNIVERSITY OF NORTHERN IOWA

Gretchen R. Lawyer
University of Northern Iowa
May 2007

ABSTRACT

This paper describes action research integrating Microsoft PowerPoint with reading fluency instruction in a group of 6 first grade students. Included is a literature review examining multimedia, hypermedia and reading fluency. Students used CD-ROM storybooks as models for reading fluency, received direct fluency instruction, and wrote stories they developed into "talking storybooks" with Microsoft PowerPoint. Results showed students improved overall reading fluency, except reading rate. Expression and prosody were most positively affected. A rating scale measured student attitudes towards the instruction. Results showed a positive reaction. In addition, it was found that students might have been indirectly motivated by the technology. The study concluded PowerPoint created talking storybooks was an effective integration strategy for reading fluency, writing, and technology.

This Research Paper by: Gretchen Lawyer

Titled: USING POWERPOINT CREATED TALKING BOOKS
FOR READING FLUENCY INSTRUCTION

Has been approved as meeting the research requirement for the
Degree of Master of Arts in Education

5-10-07
Date Approved

Mary C. Herring

Graduate Faculty Reader

5/10/07
Date Approved

Leigh E. Zeitz

Graduate Faculty Reader

5/10/07
Date Approved

William P. Callahan

Head, Department of Curriculum and Instruction

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CHAPTER 1.

INTRODUCTION

This research project began as an interest in how multimedia tools could be used to instruct and improve reading fluency. Many teachers use CD-ROM books or “talking storybooks” with their students, but I was interested in how students could be more involved in projects that integrate reading fluency and multimedia. I also was curious about how a simple presentation tool such as Microsoft PowerPoint could be used by students to create electronic storybooks for fluency instruction. This project involved using PowerPoint to create electronic student authored talking books integrated with writing and reading fluency instruction. Instruction consisted of a combination of teacher-directed and collaborative student-centered activities. Students completed the activities individually and in small groups. This allowed for differentiation of instruction and collaborative work. The unit of lessons spanned five weeks.

Statement of Problem

The rationale for this project was based upon emphasis of improved reading fluency from the local up to the national level. The participating school district desired more growth in the kindergarten through third grade reading skills as indicated in the comprehensive school improvement plan. Reading fluency was one of the skills assessed and used for reporting reading data to the state. Reading fluency in particular is a major indicator of reading comprehension and overall reading success (Perkins, 2003; National Reading Panel, 2000). In addition, the Reading First Initiative of the No Child Left Behind legislation identified reading fluency as one of the five important parts of reading instruction (U.S. Department of Education, 2002). The school already used the Read

Naturally approach (Read Naturally, 1998) and CD-ROM talking books as methods to instruct fluency. The problem in this setting was how to more effectively deliver reading fluency instruction with multimedia.

Research Questions

1. Will students' oral reading fluency improve with instruction that uses student created talking books made with PowerPoint presentation software?
2. How will this intervention affect students' attitudes towards reading and writing?

Definition of Terms

The following terms are used in the action research and in the literature review.

Below are their definitions and the context in which these terms were used in the project.

Reading Fluency

Reading fluency is the premise for the action research project. I have based my project and literature review around this summary:

Fluency is the ability to read a text accurately and quickly. When fluent readers read silently, they recognize words automatically. They group words quickly in ways that help them gain meaning from what they read. Fluent readers read aloud effortlessly and with expression. Their reading sounds natural, as if they are speaking (National Reading Panel, 2000, p.22).

Multimedia

Roblyer (2004) describes multimedia as "multiple media" or "a combination of media" that includes sound, pictures, text, motion video or a combination of those things (p.164). Most multimedia today uses hypermedia, or links to other information within the

application. This project approached multimedia without much use of hypermedia, however the review of literature uses information from multimedia and hypermedia research.

Prosody

Prosody refers to characteristics of natural speech such as pitch, intonation, and emphasis on certain words, accents, and pausing during reading (Heibert, Lehr, & Osborn, 2003.). The term prosody is not well known or used much outside of reading researchers, but the characteristics of prosody are considered important to fluent reading.

Talking Books

Talking books are multimedia stories, usually on CD-ROM that use supportive resources otherwise known as “supported text” to improve comprehension and extend learning opportunities for the reader (Anderson-Inman & Horney, 1999, p.128). Our use of Microsoft PowerPoint presentation software used CD-ROM talking books as models for fluent reading in the action research project then students created their own talking books. Talking books have been widely used in classrooms.

New Literacies

New literacies refer to being able to communicate with “ a suite of tools and media. This includes hypertext, graphics and multimedia” (North Central Regional Educational Laboratory 2003 p.12). This topic was included in the literature review because the increase in non-print media offers a different way of reading that should be considered when instructing reading fluency.

CHAPTER 2.

METHODOLOGY

A review of the literature in reading fluency research and supported technologies was used to develop this plan of study. After careful analysis of the different technologies used to improve reading fluency, multimedia was chosen as the technological approach to instruct reading fluency based on a similar project completed by Oakley (2003). The integration plan was developed based on data from a first grade classroom in the participating school and from the school district's comprehensive school improvement plan.

Description of the Project

The study took place in a first grade classroom in a medium sized town located in eastern Iowa. The neighborhood is a mix of blue collar and professional families. Six students were chosen by the classroom teacher to participate in the five-week study. The students in the study were first graders who had been identified as less fluent readers as determined by standardized tests, informal reading inventories, and teacher observations. Two girls and four boys were in the group.

Instruction took place in the classroom during the class's literacy block four days a week for approximately 50 minutes each lesson. Students used five iMac computers in the classroom. Microsoft PowerPoint, Kidspiration concept mapping software, and Living Books interactive CD-ROM storybooks were used on all of the computers. The Internet was accessible from each computer, but not simultaneously. A LCD projector was used for presentation at the culmination of the project. A networked printer, which was available in the school office, was also used.

Data Collection

This study used three types of data: (a) fluency assessment, (b) student rating scale, and (c) project log. Data was collected in three ways:

1. Before the intervention with a fluency assessment and student rating scale.
2. During the project with the project log.
3. After the study with the same reading fluency assessment and student rating scale.

The fluency assessment analyzed students' reading fluency within the project's context. A reading fluency passage was given to students before the intervention and after completion of the project. Students read a 1.5 grade level passage for one minute. A rubric was used to score the reading based on rate, accuracy, expression, and prosody (See Appendix A). The student rating scale assessed student attitudes towards reading, writing, group work, and technology before and after the project (See Appendix B). This assessment was a Likert scale, but used pictures instead of numbers to rate student responses since pictures were more appropriate to rate student attitudes with this age group. This instrument helped gauge student reaction about participation and learning during the project. The project log looked at the study as it aligned with instructional goals and objectives of the lessons. Data was added to the project log with each lesson. It included a chart for observations, notes, and questions (See Appendix C). The feedback from all instruments was used to gather data on strengths and weaknesses of the instructional design including; learning environment, use of hardware and software, student grouping, teacher feedback and support, and instructional content. The student

survey was used to organize student responses into categories to better understand students' reaction to the project.

Research Design and Procedures

This study used the action research design model (Holly, M., Arhar, J., & Kasten, W., 2005). This model allowed the researcher to examine first graders' reading fluency in a collaborative setting with the students while developing and testing theories about their learning. The researcher used "a continuing cycle of action, observation, and reflection of the consequences of the action" in the study to support the Holly, Arhar and Kasten action research model (p. 31). The completed research proposal was shared with the classroom teacher and building principal. The researcher met with the classroom teacher to prepare the classroom environment for the project. Lessons were prepared and a short presentation was created on PowerPoint for the classroom computers to troubleshoot for technical difficulties and prepare the instructional environment.

Statistical Analysis of Collected Data

The study was qualitative and used three types of measures to determine the significance of the outcome of the project. The fullest amount of information was recorded to ensure accurate and credible data analysis. The fluency assessment, student rating scale, and project log helped analyze the data from different perspectives to determine how reading fluency and attitudes towards reading and writing were affected by fluency instruction with the use of multimedia. Categorizing and comparing the results were used to analyze each type of data. Data from the project log was analyzed through inductive analysis. Johnson (2005) describes inductive analysis as "to observe a field and create order by organizing items into groups or categories" (p.91). The categories that

emerged from the project log data were *student performance in the project* and *student attitudes towards the project*. Responses from the attitude scale before and after the project were placed in a table to compare the results, as were the fluency pretests and posttests. These results are also included in graphs found in the appendix.

CHAPTER 3.

REVIEW OF THE LITERATURE: THE ROLE OF MULTIMEDIA AND HYPERMEDIA SOFTWARE IN READING FLUENCY INSTRUCTION

Introduction

Reading fluency, once an overlooked skill it is now a major goal of reading instruction (Kuhn, 2004). Fluency is one of five elements in developing reading skills as identified by the Nation Reading Panel (Withrow, 2005). Phonemic awareness, phonics, vocabulary, and comprehension received heavy attention in school reading curriculums. Fluency, however was de-emphasized in favor of the other four reading skills. Fluency is now identified as a core-reading component in the No Child Left Behind Act and is gaining attention in K-12 education settings in light of federal and state reading achievement standards (U.S. Department of Education, 2002). The Reading First Initiative (Chudowsky et al., 2003) requires districts applying for funding to include fluency instruction and provide data that shows fluency growth. This increased emphasis also stems from the high percentage of students labeled not proficient in reading. The National Assessment of Educational Progress found that 44% of American 4th graders could not read fluently (Pinnell et. al., 1995/2003). It is not surprising that educators are concerned about their students' reading fluency and the instruction to improve it.

Technology may seem like the perfect panacea for teaching reading fluency. The increased availability and advancement of technology resources gives educators more options to teach fluency than in the past. Multimedia and hypermedia computer software is steadily improving in its ability to enhance reading instruction. Multimedia software “combines still pictures, sound, motion video, animation, and/or test items combined in a

product whose purpose is to communicate information” (Roblyer, 2003, p. 164).

Hypermedia software connects text, video, and graphics through hypertext links (Roblyer, 2003). Familiar multimedia formats like electronic storybooks have been used to aid students' reading fluency, but newer capabilities like speech recognition show promise in this area as well. In addition, teachers are using more student-centered and constructivist approaches to improve fluency with multimedia and hypermedia authoring software.

The changing nature of literacy in today's digitally saturated environment is affecting the way children develop reading skills. Reading instruction, including fluency development is adapting to the needs of students in a multimedia world where visual information and non-linear text is more prevalent and more important than ever before. Students will need to adapt to these “new literacies” to be fluent readers of digital content. As digital content becomes more interactive, the line between reading and writing becomes blurred. Multimedia authorship becomes a tool for understanding content and communicating personal interests and ideas. With the high interactivity of the Internet and other digital forms of information reading fluency becomes much more than decoding text accurately. It involves to a higher degree, the ability to make sense out of many types of media simultaneously in a social context. Reading fluency has evolved from a linear process to a dynamic one that continues to change.

This review of literature addresses the role of multimedia and hypermedia software in fluency instruction and to discuss its potential for improving reading fluency in the digital age. Research in reading fluency and the characteristics of multimedia and hypermedia was analyzed to determine their effectiveness in fluency instruction. The

review examines reading fluency research and how it has influenced instruction. It discusses characteristics of multimedia and hypermedia software in relation to reading processes, explores how this software has been integrated into reading fluency instruction and what it means to be fluent in the age of digital literacy.

Methodology

This literature review was completed using different techniques to locate, select, and analyze sources. Keywords used included *reading fluency*, *computer assisted instruction*, *talking books*, *electronic text*, *instructional software*, *multimedia software*, *hypermedia software*, *interactive books*, *new literacies*, and *digital literacy*. Electronic databases via the Internet were the primary means of locating source materials. The reviewer's search methods included accessing the EbscoHost searchable on-line database through the Marion Public Library in Marion, Iowa and ERIC Silver Platter database via the University of Northern Iowa's ROD on-line library services. Sources selected dealt with instructional software, reading fluency research, and digital literacy. Not many sources linked *multimedia software* and *reading fluency*. The review analyzed sources by placement in refereed journals and those with peer review. Sources selected were also those referenced in other distinguished articles and texts.

Review of the literature included sources that provided a wealth of information about reading fluency and multimedia research. Criteria for sources included examples of classic reading research. Some of the references may appear outdated but are relevant because of the impact they have had on reading instruction and curriculum. The review also included newer research to address the emphasis on reading instruction as it applies to standards and emerging technologies for fluency instruction. Because technology is

constantly changing and improving, it is sometimes difficult to find well-documented research on using the latest technologies in reading instruction. This review attempted to balance the newer research with the well-established views on reading instruction and technology integration.

Analysis

The emphasis on reading fluency in American schools has changed as society's interaction with print materials has changed. In the 1800s and at the turn of the 20th century, instruction focused on oral reading. This was mainly because of the need for oral reading due to limited print materials. Elocution and pronunciation were emphasized to the detriment of comprehension. As the number of books in the home and in schools increased, the focus on oral reading fluency decreased. The focus shifted to comprehension during silent reading (Rasinski, 2003). Not until the mid to late 1900s did reading fluency regain attention. The current emphasis on reading fluency points to oral fluency as an important ingredient to comprehension and overall reading success. Instruction is used to bridge decoding and comprehension. This follows a constructivist philosophy that values the importance of constructing knowledge through inferences (Samuels, 2002). Now that digital print and other media are literally at the fingertips of students through computers, the focus on reading fluency will continue to evolve as new skills are needed for digital literacy.

Background on Reading Fluency Research

Research in the field of reading indicated that fluency is a key factor of reading comprehension and that fluency influences one's future reading success (Perkins, 2003; National Reading Panel, 2000). The Reading First Initiative, a part of the No Child Left

Behind Act, requires districts to use scientific-based research to guide instructional practices in order to receive federal funding for programs. Rentner et al. (2003) found that despite the pressure to adhere to No Child Left Behind regulations, schools have not been diligent in their use of scientific research to inform instruction. They urge educators to “pay attention to research-based evidence about whether a particular practice improves student learning and could benefit from more clarity about which programs and practices actually do what they purport to do” (p. 125).

Definition of Fluency

The definition of reading fluency has evolved, as society’s literacy needs have changed. The idea that fluency serves as a bridge between word recognition and comprehension is more prominent than it was in the first half of the 20th century. Heibert, Lehr, and Osborn (2003) analyzed definitions of reading fluency. Some of these definitions emphasized the increased role of automatic and accurate word recognition (LaBerge & Samuels, 1974; Samuels, 2002; Stanovich, 1991), while others focused on appropriate use of expression in oral reading (Allington, 1983; Dowhower, 1987; Schreiber, 1987). The ability to focus solely on comprehension without putting effort into decoding (Meyer & Felton, 1999) was also cited as a part of reading fluency. The National Reading Panel (2000) summarized the key features of fluent reading:

“Fluency is the ability to read a text accurately and quickly. When fluent readers read silently, they recognize words automatically. They group words quickly in ways that help them gain meaning from what they read. Fluent readers read aloud effortlessly and with expression. Their reading sounds natural, as if they are speaking” (p.22).

The Literacy Dictionary: The Vocabulary of Reading and Writing further advocates the importance of fluency for the development of comprehension, stating that fluency entails "...freedom from word identification problems that might hinder comprehension" (Harris & Hodges (1995, 2002, p. 85). The authors also explain the importance of an effortless automaticity in reading where word recognition and understanding occur simultaneously.

Characteristics of Fluency

Effective instruction requires teachers to know the characteristics of fluent readers. The basic processes they use are decoding, comprehension, and attention to the text through "...cognitive energy used in mental processing tasks." (Samuels, 2002, p 169). These readers are quick, expressive, break text into larger phrases, and can typically recall 65% of words read automatically (Perkins, 2003; Samuels, 2002). "Rapid recognition of these 300 words during the primary grades forms the foundation for fluent reading" (CIERA, 1998). Being able to read in meaningful chunks, and to separate the text into appropriate clauses and phrases enables expressive reading (Perkins, 2003; Samuels, 2002). Fluent readers use prosody which is defined as characteristics of natural speech such as pitch, intonation, and emphasis on certain words, accents, and pausing during reading (Heibert, Lehr, & Osborn, 2003). Prosody also includes textual reading cues such as headings, bold face or italics, or all capital letters. When these elements are combined, the reader can focus the attention on the text and thereby recognize the words and comprehend simultaneously. It is this ability to attend to the text without switching between decoding and comprehension that leads a reader to becoming more fluent (Samuels, 2002; Rasinski, 2003).

Readers who struggle with fluency usually have poor or below average word recognition skills. They read word by word, skip words, or repeat words. When this happens word recognition and comprehension compete for attention, making reading more laborious (Samuels, 1997.) Heibert, Lehr, & Osborn, (2003) described the research of information processing researchers of the 1970s who studied word recognition. These researchers found that less fluent readers required more work towards word identification and focused less on understanding the text. These less fluent readers could not process the meaning of the stories when they were trying to process the phonological symbols and cues.

Instructional Techniques

Fluency has been taught in many ways, but the most recommended and effective approach is repeated readings. The task is essentially what it says. The student reads a text or a portion of text several times with the intention of improving rate, accuracy, and expression. Reading the same passage several times has been shown to improve recall of significant information, comprehension, as well as improving reading rate and accuracy (Raskinski, 2003). This strategy also leads to better phrasing which makes text processing more efficient. Repeated reading, which is based on information processing theory has led to many activities teachers can use with reading instruction (Armbruster, Lehr, & Osborn, 2003; CIERA, 1998; Heibert, Lehr, & Osborn, 2003; Perkins, 2003; Samuels, 2002). Teacher-assisted repeated oral reading uses the teacher to model fluent reading and give immediate feedback. This is very effective but could require a large amount of one-on-one instruction that is not always possible in the regular classroom. Choral reading uses the same text as small groups practice and read together. Paired reading

pairs a fluent reader (parent, tutor, or a more advanced student) with a struggling reader to assist with and model fluency. Reader's theater gives students the opportunity to rehearse lines from a script and perform for an audience. Tape-assisted reading or reading while listening (RWL) uses the effect of teacher-led repeated oral reading but the student listens to a fluent reading from a recording and then reads along with the tape. Computer-assisted reading gives the student repeated reading practice using speech recognition software and immediate feedback on fluency performance. This approach was found to improve fluency, word recognition, and comprehension in students ranging from first through fourth grades (Mostow, Aist, Burkhead, Corbett, Cuneo, Eitelman, Huang, Junker, Sklar, & Tobin, 2003).

Other methods used for reading fluency include guided reading and high frequency word recognition. The National Reading Panel (2000) has shown that guided reading improves overall reading ability. Guided reading uses books at the reader's instructional level to guide reading with teacher support. In this way the teacher scaffolds instruction with connected text within a repeated reading environment. Instruction with high frequency words is also important to reading success. It is used to increase sight word recognition of the most common words encountered in text (CIERA, 1998). However, the most success in reading fluency is shown by repeated readings of high frequency phrases. Rasinski (2003) suggests doing repeated readings of high frequency words in phrases and short sentences. "Repeated readings of a few phrases per week not only gives students the practice they need to learn high-frequency words, but also gives them practice in reading phrases which is key to developing fluency." (p.99).

Considerations

Struggling readers need effective fluency instruction to improve overall reading performance. Immediate feedback and exposure to texts with core vocabulary is important to improve struggling readers' fluency (Perkins, 2003). In addition, repeated oral reading and attention to the natural language of the text should be incorporated. Improvement requires time and a substantial amount of reading (Heibert, Lehr, & Osborn, 2003). Fluency development is gradual and will develop at differing paces according to the reader's background knowledge and the type of text presented. High quality fluency instruction should be used as just one part of the total reading program (National Reading Panel, 2000). Instructional synergy combines the most effective strategies to produce the most powerful results. Fluency is not just an individual lesson, but combines oral reading activities throughout the instructional day. Modeling, support, coaching, practice through repeated reading and authentic performances all contribute to improved fluency (Rasinski, 2003). Assessment and continuous monitoring is also critical for developing fluency. Assessment tools such as the DIBELS Oral Reading Fluency and Retell Fluency assessment help ensure that readers are placed in the right instructional level. Frequent progress monitoring also helps teachers develop systematic instruction.

Multimedia and Hypermedia Software in Fluency Instruction

Multimedia and hypermedia software has been used to enhance student learning in many different content areas (Roblyer, 2003). When information is represented with multiple types of media it is learned more easily and may improve motivation and time on task (Carlin-Menter, & Shuell, 2003). A wide variety of software products with multimedia characteristics have also been used to teach and improve reading fluency

(Adams, 2002; Anderson-Inman, & Horney, 1999; Bergman, 1999; Oakley, 2003). Over recent years improved technology has integrated characteristics of multimedia and hypermedia into reading software. Electronic books, instructional software programs, and multimedia and hypermedia authoring tools all have been used in classrooms to enhance reading fluency.

Characteristics of Multimedia and Hypermedia Software

Supported text, user control, and speech recognition are components in multimedia and hypermedia software that assist the reading process. Used in talking storybooks and instructional software, text-to-speech support gives the student auditory feedback on selected text. Topping (1997) explained that research showed students used this support inconsistently, sometimes selecting text for known words and other times skipping unknown words. However Topping explained that text-to-speech computer capabilities can encourage repeated readings, help scaffold instruction, and give translational support to help second language learners. Graphics also support text by stimulating the reading environment and motivating students. This illustrative support includes pictures, graphics, or video. Multimedia software gives the user control over the speed, voice, and segmentation of text. ULTimate Reader software uses different speeds, and phrases in electronic speech (Topping, 1997). Bergman (1999) indicated reading rate control improved accuracy and comprehension when using reading-while-listening (RWL) techniques with electronic storybooks. Speech recognition software is effective in improving fluency, word recognition, and comprehension in beginning readers (Mostow, et al, 2003). It recognizes a reader's speech, gives immediate feedback, and may allow the student to write and narrate stories. It can monitor student progress in rate and

accuracy, giving detailed records of performance (Adams, 2002). The Reading Tutor software program (Mostow, et. al. 2003), and Quick Reads Technology edition from Pearson Learning (Heibert, 2004) are some of the software packages that use speech recognition specifically for fluency.

Talking Books

Talking books use supportive resources otherwise known as “supported text” to improve comprehension and extend learning opportunities for the reader (Anderson-Inman & Horney, 1999, p.128). Supportive text features include text-to-speech capabilities, graphics, and user control. Text-to-speech capabilities enable the student to hear the computer model fluency and the student can read along with the computer, read repeatedly, or read selected difficult or high frequency words. Text-to-speech is common, effective, and supports the process of reading while listening (Bergman, 1999). Pictures and graphics may stimulate the reading environment and create motivation (Roblyer, 2003). Text highlighting gives the reader cues and engages the reading process. In an electronic book format, the reader can also control the speed, voice and text segmentation. Research on electronic text showed that they might be more effective for learning if supportive resources "assimilate and accommodate new concepts into their cognitive schema"(Anderson-Inman & Horney, 1999, p.163). Comprehension was shown to be higher when students used a talking book format compared to a traditional book but students may overuse animations in CD-ROM storybooks and interrupt the reading process (Anderson-Inman & Horney, 1999).

Instructional Reading Software

Instructional software programs used for reading fluency vary widely in their scope and technological features. Computer-assisted repeated reading programs such as Read Naturally (2004) use the same approach as tape-assisted methods, but with a computer format. The advantage is that they use visual and auditory processing instead of just an audiotape (Roblyer, 2003). Instructional software can track student progress easily and may increase motivation more than with tape-assisted reading. Individual words may be highlighted and clicked to hear correct oral reading. Speech recognition software is becoming more available as the technology improves. This offers the method of repeated practice with support (Carlin-Menter & Shell, 2003). Reading Partner is a speech recognition program for beginning readers that provides interaction through prompts, repetition, reader comments, and extra practice (Kareal, 2006). Programs that have more interaction are beneficial because they offer immediate feedback when a teacher is not available. As technology improves, more reader support is included with these software programs.

Integrated learning systems (ILS) share information over a network and the scope of instruction entails more than one aspect of reading. It may involve comprehension, vocabulary, and word identification in addition to reading fluency instruction (Roblyer, 2003). Integrated learning systems generally have a direct instruction approach, typically using remediation. It may replace a large amount of teacher instruction, especially in large urban districts. Research shows a great variety of impact depending on the way the system is implemented into the curriculum (Roblyer, 2003). Integrated learning systems are more effective when used with the existing curriculum. They motivate students,

increase the amount of learning time for each student, and differentiate instruction for each learner. An example is Riverdeep's Destination Reading, grades preK-3. It uses a balanced literacy approach, with fluency being an integral part of the course (Riverdeep Inc., 2005).

Multimedia and Hypermedia Authoring Tools

Multimedia and Hypermedia authoring tools include presentation software such as Microsoft PowerPoint, video production and editing systems, and hypermedia authoring software such as Hyperstudio, Mpower, and Digital Chisle (Roblyer, 2003). PowerPoint and Hyperstudio are two common multimedia authoring software programs used in K-12 education. There is little research on using multimedia and hypermedia authoring tools specifically for fluency, although these applications have been used extensively with other aspects of reading, writing, and in the content areas. Multimedia authoring tools converge reading and writing (Carlin-Menter & Shuell, 2003). This convergence provides more integrated learning in the classroom.

The research on multimedia shows some benefits multimedia software has for student learning and the positive effects it can have on instruction. Bagui (1998) explained the "parallels between multimedia and the natural way people learn" with visual information and imagery (Multimedia/hypermedia section para. 2). Multimedia software supports and enhances learning because the learner can use text, auditory stimuli, visuals, and imagery with the software. This dual channel of language and visuals allows the learner to process and retrieve information more efficiently, thereby improving understanding and retention of the material (Bagui, 1998). Multimedia is advantageous in that it scaffolds students' learning, engages students in the learning process and is suited

for a variety of learning styles (Glasgow, 1997). Multimedia software's interactive nature, its flexibility, rich content, and user control create a motivating environment that promotes increased learning (Peng, Fitzgerald & Park, 2006; Carlin-Menter & Shuell, 2003). It also supports discovery-oriented instruction allowing students to construct their own knowledge. This type of learning helps students transfer knowledge to new situations (Bagui, 1998). Carlin-Menter and Shuell (2003) found that students' writing organization improved with these tools. Creating with multimedia also promoted multidimensional thinking. This leads one to consider whether the use of multimedia-authoring tools in the literacy classroom may improve a reader's ability to organize text during the reading process.

Specific types of multimedia software have been shown to improve reading levels of elementary students. Doty, Popplewell, and Byers' (2001) research of CD-ROM storybooks supported the conclusion that multimedia improves reading comprehension. Their review of literature also noted growth in sight word acquisition and reading level when using electronic talking storybooks. A study by Oakley (2003) examined the effects of using a hypermedia-authoring tool on reading fluency of third grade students. The students who created talking books were shown to improve overall fluency. Each student improved expression, phrasing, and comprehension, however there was no indication of a great improvement in accuracy. In addition, students improved self-esteem, comprehension, and information and communication technology skills.

Multimedia and hypermedia authoring tools can play a role in reading fluency but one must consider how the application fits into the instructional design process (Roblyer, 2003). The designer also must make sure the screen design complements the purpose of

instruction. Effective multimedia programs should help the reader focus attention on the task, and encourage information processing. The screen design should engage the student to the content of the program and help the student navigate efficiently through the program (Roblyer, 2003). It is important to prepare students for using multimedia-authoring software. Teachers need to explain and model the difference between linear and non-linear digital text. Students should understand multimedia design and have adequate time and support from teachers before embarking on multimedia composition (Carlin-Menter, and Shuell, 2003).

Influences of "New Literacies" on Reading Fluency

Today's digital world is pushing the boundaries of what has been traditionally regarded as literacy. Now being literate includes more than just being able to read and write words. The definition of text is changing. The North Central Regional Educational Laboratory (2003) explained that in the 21st century, text goes beyond the written word and is "...communication with a suite of tools and media. This includes hypertext, graphics and multimedia" (p.12). Digitization has merged otherwise separate forms of communication such as written language, audio, and video into one medium. New literacies in a digital environment increase the need for new skills (Healy, 1998; Kist, 2005; Burkhardt, Monsour, Valdez, Gunn, Dawson, Lemke, et al., 2003). We will need visually intelligent learners who use "visual reasoning to read, write, and communicate" (NCREL, 2002, p.12). Today's learners will be tomorrow's leaders. They will need practice with authoring with multimedia while using new skills for the digital age.

Multimedia Authorship and the "New Literacies"

Being literate in the 21st century means something much different from basic reading, writing, and computation skills. The increase in non-print media offers a different way of reading. Even when materials are printed in a digital format there is less linearity. The reader chooses the sequence. "There is an increasingly interactive, nonlinear experience." (Kist, 2005 p.5). Literacy is also associated with social perspective. When working on reading fluency, teachers look within the context of a digital society that values and embraces multimedia. Fluency is not separated from the influence of multimedia. Withrow stated in *Literacy in the Digital Age* (2005), that before 1950 the key to all formal education was to be able to read print-based books. But now that television, audio programs and computers are all competitors for reading time, literacy in the digital age requires one to critically analyze everything read, viewed, and heard (Healy, 1998; Withrow, 2005).

New Skills for the Digital Age

The digital world we live in requires a broader range of literacy skills. Intelligence in the information age consists of the ability to problem solve, manage information, monitor one's learning, communicate, and to make critical inquiries (Healy, 1998). There has been a transformation from a reliance on written words to an emphasis on images and visual symbols. Readers in a multimedia environment use a variety of cues to make sense of what is being read (Kist, 2005). Withrow (2005) writes of the importance of digital libraries in the near future. Already, schools have access to a multitude of digital material. Courseware, multimedia lessons, the World Wide Web, project-based learning, individual and cooperative learning, and voice activated learning will all require the skills

to navigate through digital material seamlessly. According to Burkhardt et al.(2003), scientific, economic and technological skills are critical to a multimedia world. Visual literacy, information literacy and being able to understand multicultural and global issues are part of success in the changing literacies of the 21st century.

Teachers also need skills to be successful instructors in a digital world. They must focus on the changing needs of students. Digital content and computer assisted learning allows for differentiation of learning, so teachers need to shift to a more flexible and individualized style of instruction (Kist, 2005). The skill of organizing experiences for the learner is critical in the digital environment. Distance and on-line learning has a greater place in students' lives. A new paradigm for learning in a digital environment values collaborative learning, teamwork, shared goals, and active creation of knowledge (Palloff & Pratt, 1999). Teachers need to be able to support this type of cyber social learning environment.

Discussion

Research showed that reading fluency is closely tied with success in reading comprehension and those that struggled with fluency were likely to be poor readers for life (National Reading Panel, 2000; Perkins, 2003). Fluency was described as difficult to teach in that it takes considerable time to develop. It is a gradual process that requires repeated practice at an appropriate reading level. Those students who retained high frequency words rapidly had a better foundation for fluent reading (CIERA, 1998), therefore fluency was more difficult to instruct with readers who lacked sight word proficiency. Multimedia and hypermedia offered the possibility of enhancing fluency instruction with instructional software, electronic talking storybooks, and with

multimedia and hypermedia authoring software. Computer software with multimedia characteristics has been shown to improve comprehension and retention rates, which is a key component of reading fluency. Many of these programs incorporated repeated readings, reading while listening, increased sight word recognition activities, and highlighting phrases, all of which supported fluency acquisition. Characteristics such as supported text, user control, animation, sound, graphics, and most recently speech-recognition, motivated students and improved the reading environment. These elements engaged readers and improved their comprehension rate (Bagui, 1998; Doty, Popplewell, & Byers, 2001; Glasgow, 1997). In addition, user control individualized the instruction making it more effective for a variety of learners (Bergman, 1999).

Uses of multimedia and hypermedia software to improve reading fluency in an authentic context were examined as an integrated approach to instruction. As students interacted with electronic storybooks, instructional software, and authoring software they constructed their own knowledge (Bagui, 1998). This new knowledge was more easily transferred to other reading situations. Research on using multimedia and hypermedia authoring software demonstrated how reading fluency could integrate social, communication, and presentation skills in a technologically-rich environment. Consideration was given to more common applications such as PowerPoint, MPower, and Hyperstudio. Presentation software and authoring tools gave more flexibility to integrate technology into fluency instruction. Repeated oral readings, peer assisted repeated reading, interactive writing activities, and visual literacy skills could be used in the same setting to improve reading fluency. This authentic and student-centered

approach motivated students who were otherwise turned off to reading because of the learned helplessness they had experienced (Oakley, 2003).

The role of reading fluency may be changing because of our society's increased use of and dependence on multiple forms of media for communication. Fluency in a multimedia environment was considered, as an important factor in designing instruction to support learning needs in the digital age. Non-linear and choice-driven reading changes how readers interact with text, making reading a dynamic process. The abundance of digital content available for students was cited as a reason to encourage reading skills beyond just decoding and reading quickly. Readers need to be able to deal with visual and auditory information in addition to text so they can make sense of what they read.

Conclusions and Recommendations

The link between reading fluency, comprehension, and lifelong reading success is powerful. Reading instruction without technology is critical but the impact of multimedia and digital content warrants further consideration of technology's role in reading fluency. Multimedia programs have been shown to enhance instruction and improve learning. Fluency instruction supported with multimedia and hypermedia software has the capability to increase sight word retention, improve information processing, model proper fluency, and motivate the reader. Multimedia features such as supportive text, user control, and text -to-speech capabilities can potentially improve reading fluency. Multimedia and hypermedia software motivates and encourages poor readers; therefore students engage in the reading process and improve their attitude towards reading. Those who read regularly often acquire more core sight words and vocabulary, becoming more

proficient readers. Teachers need to choose the appropriate technologies for reading support. Talking books, instructional software, and multimedia authoring tools all support fluency in different ways. The teacher must carefully analyze the fluency needs of the students and then choose the technology that most appropriately addresses those needs.

It is critical that technology not replace quality classroom instruction. The key to students' reading success is good teaching based on proven instructional methods. However, there is a need for a more comprehensive approach to supporting reading fluency. Multimedia and hypermedia software should be used, as one part of fluency instruction, not isolated from or in place of the reading curriculum. Teachers should consider the needs of individual students. One size does not fit all. Features such as supported text, user control, and voice recognition will help to differentiate instruction as those technologies improve. Interactive talking books can be used more systematically for repeated oral reading activities to support fluency instruction. Teachers can make use of the text-to-speech feature, integrating it with instruction to model good fluency and to improve basic sight word recognition, which is a critical step in achieving fluency. More research is needed in the use of software authoring tools to improve fluency. Action research should be pursued with teacher and student created talking books, presentation software, and other multimedia projects that may potentially improve reading fluency.

Today's learner experiences multimedia everyday through television, radio, the Internet, and computers. These multimedia sources have shaped teaching and learning. Fluency should take advantage of these capabilities. This review of literature can be used to prompt educators to take a serious look at the role of multimedia and hypermedia software in fluency instruction. The digital world requires strategies that help readers

make sense of more than just static written material. As more content becomes available digitally through visual and non-linear ways, readers will have to be fluent in interacting with the new media. Fluency will not just be decoding and comprehending text. It will be synthesizing multiple media into meaning. These complexities need to be addressed as a part of fluent reading. Multimedia applications should be used as a part of fluency instruction in ways that address the changing needs of readers in the 21st century.

CHAPTER 4.

RESULTS

The data from the study was organized and analyzed around the research questions posed at the beginning of the study. Some of the results did not fit with the original research questions but were still applicable and important to the study. These results are described and examined as unanticipated outcomes. This section of the paper explains data was organized, analyzed, and interpreted from the action research project. Data was analyzed from (a) fluency pretests, (b) the students' multimedia talking book projects, and (c) the fluency posttests, to address each research question. The type of data collection instrument used organizes the paragraphs following each research question. These paragraphs give a detailed explanation of the data.

Effects of Instruction on Oral Reading Fluency:

Research Question # 1: Will students' oral reading fluency improve with instruction that uses student created talking books made with PowerPoint presentation software?

Results of Fluency Pre-tests

The evaluation rubric was designed so the researcher was able to look at more than just rate and accuracy, which is normally reported in fluency assessments. It was important to look at the whole picture of fluency because the review of literature indicated that the ability to use phrasing, pitch, and expression in addition to good rate and accuracy is closely tied to comprehension. At the beginning of the project there was a large gap between the highest and lowest fluency scores in the group. Four of the six students read the grade level passage at or above 50 words per minute. One student read below 30 wpm, showing a distinct gap in reading rate within the group. Students were

reading with accuracy. All read the passage at the instructional and independent levels, with the lowest student's accuracy rate at 93% (See Table 1 and Appendix B.1).

Table 1.

Results of Reading Fluency Pre and Post Tests

Student	Rate (wpm)	Accuracy %	Expression	Prosody
	Pre/Post	Pre/Post	(rating 1-4) Pre/Post	(rating 1-4) Pre/Post
A	57/103	97/98	3/4	2/3
B	25/44	93/98	1/4	1/4
C	82/65	98/97	2/4	1/4
D	84/68	100/100	2/3	2/3
E	61/82	95/99	2/3	1/3
F	63/49	97/96	3/3	2/3

Note: Students in the project were given letter names and are identified as such.

The researcher was initially surprised by how quickly and accurately most students read the passage. But once their use of expression and prosody was analyzed their use of expression and prosody it became apparent why the classroom teacher wanted help for these students' oral reading fluency. Most students scored low in their use of expression and prosody with the passage. They rarely varied pitch and tone and did not emphasize words. They used textual cues rarely or not at all and it was difficult to hear phrasing. Students' reading was monotone, and choppy. Four of the six students did not use appropriate phrasing and expression appropriately. All six students showed difficulty with elements of prosody.

Reading Fluency Lessons

The first week of instruction was based around modeling good reading fluency practices. Mini-lessons were presented on phrasing, pitch, tone, and textual cues using familiar storybooks. The first lesson was on phrasing. I modeled how to chunk words into phrases from the Eric Carle book; *Rooster's Off to See the World*. The students repeated phrases aloud from the story, and then underlined phrases on copies of the story given to them. They all were able to recognize appropriate phrases and underline them independently. Then they chose *Clifford* books to read with a partner using the phrasing techniques they had just learned. In addition to practicing phrasing from a regular storybook, students practiced reading phrases along with the CD-ROM storybook, *The Berenstain Bears Get in a Fight* in pairs. They were quiet and intent while reading along with the CD-ROM. I found that the students caught onto phrasing quickly. The next day they remembered the phrasing from the previous day's lesson and read with even better phrasing.

The next lesson was on pitch and tone. *The Foolish Tortoise*, by Eric Carle was read to them to demonstrate how to vary pitch and tone when reading. It was evident they were all very interested in the story because they made comments about the tortoise's behavior and asked questions during the reading. They practiced using pitch and tone by reading along with me for a few pages. Then they chose *Clifford* books to read with a partner using the prosody techniques they had just learned. The last mini-lesson on fluency modeled how to use textual cues to improve fluency. Again, we read *The Foolish Tortoise*. One student commented that they could use those strategies in their own stories. He used good pitch and tone and wanted to try it again to demonstrate it for the group.

Creating Students' Talking Books With Multimedia Software

After the fluency lessons students began writing stories and putting together a multimedia slideshow with their stories. The purpose of this part of the project was to put their knowledge of reading fluency into practice in a project-based learning activity. The following paragraphs below detail the steps of writing the stories and creating the talking storybooks with PowerPoint software.

Step 1: Introduction

The goals of the project were explained during the first lesson after fluency pre-tests. Students gathered around a computer and viewed a PowerPoint slideshow. Each slide explained the student learning goals and how those goals were to be achieved. Each student took a turn navigating through the slideshow and added a picture from clip art to a prepared slide. Two of the students were less competent with this task. The four other students had experience with creating PowerPoint slideshows, so they automatically helped the less experienced students at the keyboard. It was encouraging to see them help the others without being asked.

Step 2: Topic Selection

The next step was to start writing the student stories. This step only had four weeks to complete the project, so the researcher was surprised and optimistic to see that most of the students had experience using PowerPoint and inserting pictures into the slides. Each student came up with a topic for an individual story, except for the two girls who chose to work together. Finding a topic turned out to be simple. Four of the six students had already begun a "Things I Like" PowerPoint slideshow in class. Two of the boys had already chosen the topic sports, while the two of the girls chose cats. They used

those topics for this project. The other two students chose a topic right away. Their topics were superheroes and WWE Wrestling. The plan was to use the 6 + 1 Traits of Writing (Culham, R. 2003) throughout the writing process, a research-based writing instruction approach used in the district. This did not work out as planned. There was not enough time to integrate all the aspects of the 6 + 1 Traits approach into the project, however the researcher did use the traits of organization and word choice.

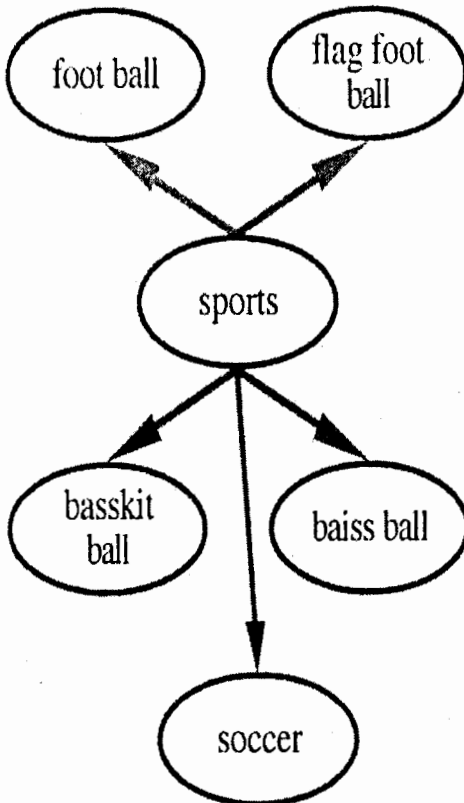
Step 3: Prewriting

The pre-writing process began as a webbing activity using Kidspiration concept mapping software (Inspiration Software, 2004.). Shortly into the project the researcher changed the story web approach to an outline and added a few spaces for each topic so it would add structure to their writing. It formed a better template for them to use for a slideshow (See Figures 1 and 2).

Once the outlines were completed and printed, students began writing detailed sentences for each heading. All of the students wrote non-fiction stories about the things that most interested them. Several books were brought in to help them with ideas and details for their stories. For the next several lessons the students were engaged in the writing process. Once, a student spent over half an hour reading and looking through a wrestling book. He filled in an entire section of his outline by using information from different parts of the book. It appeared he was synthesizing the information, and not just copying large chunks of text. This was encouraging because earlier in the project the researcher had concerns about his writing. The girls, who were working together on their story about cats, needed help with getting detailed and descriptive words. They began by

Figure 1.

Student sample of a story map made with Kidspiration software



writing a list of color words to describe different types of cats. Two of the other students were nearly finished with their outlines. All students worked through the writing process at different paces. Some progressed more quickly than others, so a few of the students began the slideshows while others continued on the stories.

Figure 2.

Student sample of an outline made with Kidspiration software.

sports

3 sentences for each box

baseball
 wen I wack the Ball
 the id if now that you were
 Book that said to wack

basketball
 National Basketball
 Wins a lot it sees
 in a Book I read

football
 Th foot Ball you
 Net a helmet and
 sees I found it in
 a Book

flag football
 ones Me and my
 freind and me
 plays flagfoot Ball
 do very good

soccer
 In soccer you H.T
 it with your side sees

Step 4: Slideshow

Once the stories were written, students were assisted in typing them onto their slideshows. By the end of the second week, five of the six students had started creating their slideshows. Mini-lessons on formatting slides with color, font, and adding graphics were presented. This phase of the project tested patience. The technical skills of the

students were varied. One needed more hands-on practice with accessing files and saving. In response to this another student was asked to act as a peer tutor. Technical problems added to the wait time for my help. One of the machines froze and had to be restarted three times during one lesson. The students called many times, "Ms. Gretchen, I need help" during the lessons when we assembled the slideshows on PowerPoint. It had been intended to teach more on the design process, especially with adding graphics but that plan was abandoned because there was a limited amount of time. Instead students drew pictures to go along with some of their slides that were scanned and added to the students' slideshows. Each student did insert at least one clipart graphic into the slides.

Step 5: Story Presentation

Once the stories were finalized onto the slides, they were printed and students practiced reading those stories aloud. The students and researcher met and rated each reader's fluency for phrasing, pitch, and tone. The students listened carefully to each story and offered constructive criticism. One student asked what tone meant. His story had good ideas, but was not very organized. The grammar he used made it difficult to decipher what he really meant. The other students gave him suggestions on how to improve the story. Students began narrating the stories onto the slides the following week. They were very cognizant of the elements of fluency. They listened to the recordings and suggested changes and noticed errors in the readings. One was particularly engaged in the recording process. She self corrected for phrasing and wanted me to underline phrases for the rest of the slides. She asked, "Was it good?" and commented when she heard a long pause in her recording, "I had kind of a big rest in the middle." The researcher noticed that she was not using appropriate pitch at the end of her

sentences. After a discussion about pitch she changed the pitch and rerecorded the narration. Other students commented that the narration “sounds different than my real voice,” but they were very interested in hearing their voices over and over again.

Effects of Technology Use

There were several occasions when the technology slowed down the project, or made circumstances frustrating for the researcher and students. The first instance of slowing down occurred with setting up the PowerPoint slideshows. Students needed more help more than could be given. Even though there were only six students to work with, students were waiting for assistance. Another lesson was interrupted when the computer froze several times. On a separate occasion students were not able to print due to toner problems. The range of students’ technology skills and experience also posed challenges. Five of the students mentioned that they used the computer at home. One commented that he did not use a computer at home. This student needed more guidance on the computer and did not catch on as quickly as the others. The most time consuming problem posed by the technology came during students’ recording narration of the stories onto their slideshows. The program would stop recording before all the narration was completed. I found that this was due to the large file size. There was not enough memory to store the graphics and the voice recordings. I solved this problem by changing some of the graphics to smaller file sizes. I even edited some of the scanned student drawings that had been placed in the slides by using Microsoft Paint. After several attempts at recording, all the students successfully narrated their stories. It took four lessons to get the recordings finished. This took much longer than expected.

Results of Fluency Post-tests

Students' performance on the reading fluency assessment showed overall improvement. Twenty-four scores were reported from the fluency assessment that included a score for each student on rate, accuracy, expression, and prosody. Of those 24 scores; 17 were improvements, two remained unchanged, and five decreased. The most positive finding was students' use of expression and prosody on the posttest. All students improved reading prosody on the posttest. Use of expression was nearly as positive. All students improved expression, except for one whose expression score remained unchanged from the pretest. Accuracy improved for three students, remained unchanged for one, and decreased for two students. Reading rate was the one area that did not show improvement for the group as a whole. Three students improved in their rate of reading while three decreased in reading rate. The half of the group with the lowest reading rates from the pretest increased substantially in reading rate. Averaging these three students' scores, they improved from 47 words per minute (wpm) to 78 wpm, improving reading rate 31 wpm. The three other students, who scored the highest on the pretest, made a decrease in reading rate. Their average reading rate decreased from 78 wpm on the pretest to 61 wpm on the post-test, decreasing reading rate 17 wpm. The half of the group that improved reading rate also improved reading accuracy. These three students improved from 95.0 % accuracy on the pretest to 98.3 % accuracy on the posttest. The half of the group that decreased reading rate also decreased reading accuracy, but only minimally. These three students decreased reading accuracy from 98.3 % on the pretest to 97.6 % on the posttest. (See Table 1 and Appendixes B.1-B.4.)

Effects of Instruction on Student Attitudes Towards Reading and Writing:

Research Question # 2: How will this intervention affect students' attitudes towards reading and writing?

Results of Attitude Scales

One hundred percent of the students reported positive or very positive attitudes towards the criteria on the attitude scale before the project began. The most positive reaction was towards using the computer for projects and towards writing (See Table 2).

Table 2.

Student Attitude Scale Results – Taken Before Project

Students' Feelings	Very Positive	Positive	Don't Care/Don't Know	Negative	Very Negative
About self as a fluent reader	3	2	1		
About being a group member	3	2	1		
About using computers to create projects	5	1			
About using computers to practice reading	1	4	1		
About self as a writer	5	1			

Students' attitudes improved in the post-project attitude scale. The largest and most positive change was shown by students' attitudes towards using the computer for reading. There was no change in their attitudes towards writing (See Table 3). Of the 30 total responses on the second attitude scale, there was only one negative change from the first attitude scale. This response was from one student, who lowered his rating of attitude towards reading fluency from very positive, to positive. Ten of the responses showed an increase in positive attitude, and 19 responses showed no change.

Table 3.

Student Attitude Scale Results – Taken After Project

Students' Feelings	Very Positive	Positive	Don't Care/Don't Know	Negative	Very Negative
About self as a fluent reader	4	2			
About self as a group member	4	1	1		
About using computers to create projects	6				
About using computers to practice reading	5	1			
About self as a writer	5	1			

Student Reaction to Reading Fluency Instruction

Overall, students reacted positively towards reading instruction and reading fluency activities. Comments and behaviors were tallied from the project log and analyzed (See Table 4). Students made more than twice as many positive comments than negative comments about reading during the project. During the first lesson, students appeared enthusiastic and confident. During a fluency lesson on using textual cues, one student volunteered to demonstrate correct use of textual cues. Students showed interest in the stories we read together during the fluency mini-lessons. They did mention that they were nervous that the stories would be shared with the rest of the class. When it was time to practice reading their finished slideshows to each other most students did this with confidence. Students acted as peer tutors during this lesson. One student did not feel comfortable reading hers aloud to the group on that particular day. However her partner was absent so this may have contributed to her unease about reading it in front of the other students who happened to be all boys. She was the only girl present that day. One boy gave an example of using pitch. Another boy, who was having difficulty using this in his reading, used the other's example and began smiling as he read it.

Students reacted positively to recording narration. When students recorded, they listened to their personal recordings and made constructive comments. Students smiled frequently when listening to their recordings. One girl asked when we would be sending out invitations to the class to see the projects. She was the same student who asked the group, "Don't you like to hear your own voice?" and the other students agreed with her. Four of the students suggested that I should do this same project next year.

Student Reaction to the Writing Process

Students appeared excited and motivated about the writing process. Positive reaction to the writing process was tallied six times more than negative comments about writing (See Table 4).

Table 4.

Inductive Analysis of Student Attitudes Towards the Project Categorized by Observed Comments During Reading, Writing, and Technology Tasks

Type of Comment	Reading	Writing	Technology
Positive	7	6	12
Negative	3	1	5

Students gravitated toward the books brought as writing resources for their stories.

During one lesson the researcher was surprised that they were not complaining about not using the computer. They were so heavily involved in their stories and wanted more time to work on them. One student struggled with getting his story on superheroes started.

There were no books on his topic available, but with the use of some superhero resources printed from the Internet he began to take a deeper interest in writing his story. The researcher wrote in the research log mid-way through the project “It seems this project is becoming more of a ‘writing project.’” During this phase the decreased time on the computer and increased writing time did not seem to discourage students. On the contrary, they were immersed in the writing process.

Unanticipated Outcomes

A careful analysis of all the data from the project I noted two trends that did not fit into the research questions. First, the writing process began to dominate the project both in students' engagement and in the amount of time spent on it. The project had evolved into a fully integrated literacy activity. Second, the students' focus on the technology was different than the researcher expected. The review of the literature on using multimedia technology led her to think that the students would be motivated by the technology, and therefore would be exclusively interested in the technology itself. The research log and student attitude scales showed that the relationship between literacy and the technology was more complicated than expected (See Tables 4 and 5).

The Writing Process Became Key to Student Engagement

It was not anticipated that the writing process would take such a central role in the project. It was expected that more time would be spent on creating the stories on the computer. Instead, students spent more time writing with pencil and paper before transferring stories to the slide shows. The focus of the project was on fluency, so it was anticipated that students would be more outwardly involved in reading. However, the writing process, (especially the revising) became the bulk of the project. Reading the stories aloud to the group and with a partner also became part of the writing process. Fluency instruction, reading fluency practice, and writing became intertwined. Technology was expected technology to be the motivating factor of the project, but it is unclear as to whether the technology or the writing process was driving motivation. Neither the technology nor the writing was easy for them. Both were challenging tasks.

The writing process was rigorous, however students were most engaged during writing time.

The Role of Technology in Students' Attitudes Toward the Project

The researcher was surprised that the computers did not become the central focus of students' attention during the project. She had thought that they would be anxious to get started on creating the slideshows, but this was not observed. Students did not complain when they were not using the computers. The presence of technology did not seem to disrupt the reading and writing instruction. Over twice as many tallies for positive reaction to technology were made compared to negative reactions (See Table 4). This is interesting, especially when the technology slowed down the project because of technical glitches. The negative reactions were based only on the technical difficulties during the project. At times it appeared that the technicalities of the computer program were getting in the way of the learning process. Students reacted negatively towards using the computer when they were observers instead of being in control of the machine. Once I had the feeling that they were bored with looking at the screen and watching the others do PowerPoint tasks when I showed them the tutorial of the project. Another negative observation was students' reliance on the researcher to proceed to the next task. They were eager to move on. Positive tallies were made when students were personally engaged in the technology (See Table 5).

Table 5.

Inductive Analysis of Student Performance in the Project Categorized by Observed Reading, Writing, and Technology Performance Tasks

Type of Behavior	Reading	Writing	Technology
Positive	8	2	3
Negative	3	2	6

This was observed when they used the CD-ROM talking storybooks. Students worked quickly on the computer, except for the one student with less computer experience who showed difficulty using the mouse and opening and saving files. All of the other students caught on quickly to the basic skills needed to create their projects. Most added clipart easily. They were also excited to see their artwork scanned and inserted on the slides.

CHAPTER 5.

DISCUSSION

Conclusions

This project led to improvements in students' overall reading fluency. However, it did not appear to make significant improvements in all students' reading rates. In fact, half of the students showed a decrease in reading rate. The most promising effect on reading fluency was in the students' use of expression and prosody. When looking back at the results of the project and the instructional methods, it makes sense that reading rate did not improve as much as the other elements of fluency. Rate was not the key objective in instruction. On the contrary, students were not encouraged to read their stories quickly because the narration needed to be read clearly at an appropriate speed on the student projects. Accuracy was important to the student stories, but expression and proper pitch and tone were emphasized the most during the project creation process. This was because expression and prosody were the lowest scored parts of the rubric on the pretest and needed the most instruction. Another possible reason for the decrease of the three students' reading rates may be due to competing attention between decoding, expressiveness, and prosody. Rasinski (2003) and Samuels (2002) explained that fluent readers have the ability to switch between decoding and comprehension. The students that decreased their reading rates from the pre to post tests already had average to above average reading rates. Perhaps their reading processes required more attention to the newly learned skills of using phrasing and using textual cues.

The project positively affected students' attitudes towards reading and writing. In addition, technology appeared to have a positive impact on students' feelings towards the

project. Students were engaged in writing their stories and creating the talking storybooks. The researcher concluded that this indicated they were involved in their own writing process, and not so concerned about the end product. The line between motivation to write and motivation to create with technology became blurred. This leads me to ask whether the capabilities of the technology they used or the content and ownership of their stories motivated them and contributed to their positive attitudes.

The most interesting phenomenon noticed from this project was that it began as a fluency project but transformed into a writing project. The purpose of the project shifted from reading fluency to the writing process. The project merged written language, audio, and images into one medium. The North Central Regional Education Laboratory (2003) describes this as 21st century text. This multimedia authorship made the project a more interactive and nonlinear experience for everyone involved in the project. The students' use of these new literacies that use interactive and non-linear forms of communication and digital media broadened the range of skills needed for the project. I found myself differentiating the learning for each student. This required a much more flexible and individualized method of instruction. The data I collected leads me to believe that a shift of focus was a natural part of learning in a multimedia student-centered environment that relied on "new literacies." Background from the review of the literature on new literacies and the digital age support this thinking. The other interesting outcome from the project showed that the students achieved most of the fluency goals that the project had set out to achieve even as the project shifted from a focus on reading fluency to an emphasis on writing as students spent much more time with writing the last two weeks of the project. I was worried that the project may have strayed too far from the original project goals.

The results showed that it did not. I think of how often this shift happened in my own classroom from past years, and how it may happen in other classrooms that incorporate digital media and new literacies with instruction.

Significance for Professional Practice

Action research links theory to practice and expands the educational knowledge base (Johnson, 2005). This research project helped explore the relationship between reading fluency and multimedia and the possible course of action beyond the initial project. Several themes emerged through this project that are significant to literacy and technology integration that should be considered in further courses of action.

The Importance of Digital Media in Literacy Instruction

The literature review suggested the importance of digital media in literacy instruction. This project just touched the surface of how digital media can be used to teach reading and writing. Only very basic features of PowerPoint were used. However, students responded very positively to using PowerPoint and the CD-ROM storybooks.

The purposeful use of technology may indirectly motivate students

This project showed how student directed technology integration can positively affect student attitudes towards learning. The important note here is that the technology was not seen as the only motivator, but it was pivotal to the positive responses from the students.

Technology is still a logistical problem in the classroom

This project similar to many other technology projects in classrooms where there were usually not enough materials, hardware, software, and instructional support.

Network connections, copies of CD-ROM storybooks, file space and memory, technical

support for students, and actual physical space were all lacking at one time or another. The process of the project showed the continued logistical problems associated with using technology, but more importantly it showed these issues did not negatively affect the project as a whole. Even though technology is a tedious medium for instruction, the project demonstrated that it could be used in a way that does not infringe on basic reading and writing goals.

The strong positive relationship between reading and writing

The student-centered and project-based nature of the project demonstrated the link between reading and writing. At first glance the project may look like a technology project but at its core it was a literacy project. Students' attitudes in reading and writing increased and their progress in reading and writing skills improved throughout the project. Approaching reading and writing skills together as "literacy skills" can help students reach learning goals.

Recommendations for Integrating Multimedia and Reading Fluency Instruction

1. Limit emphasis on technical skill objectives. Keep the focus on reading and writing goals. These basic literacy skills are the foundation for a lifetime of good reading and writing. More in depth technology skills can always be added later.
2. Anticipate a wide range of technology experience and computer skills. Some teachers may expect that students will know basic computer functions or will catch on quickly, but that may not be the case.
3. Seek out support for students who need more guidance with reading, writing, or technology. This can be from other students, paraprofessionals, or adult volunteers. I did not have other support so had to rely on the other students in the

group. This served its purpose, but older students or volunteers could have helped move the recording process along faster.

4. Work timed repeated reading into the daily lesson. It is tempting to begin focusing only on the skills students are lacking. Before the project began the weakest reading fluency skills were expression and prosody. Attention was not placed on reading rate during instruction, but this was the one area that did not show significant improvement over the course of the project.
 5. Plan for specific technology needs up front. Not having enough file space or enough Internet ready computers decreases the amount of instruction, which leads to less student learning. The teacher needs to do the technological planning before instruction begins to prevent this from happening.
 6. Keep group size small or have available the appropriate resources and support if working with a larger group of students. I would not recommend doing this project with an entire class by oneself. First, having enough computers would pose a problem, and secondly there would not be enough teacher support. Even if there were sufficient volunteers, the teacher would still need to scaffold the learning process. Remember that it is not a technology project, but a reading and writing process that uses technology as a way to facilitate the learning.
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CHAPTER 6.

SUMMARY

Using PowerPoint-created talking books for reading fluency instruction was an effective way to integrate literacy and technology. The instructional goals of the project were achieved with CD-ROM storybooks, by creating student talking books with PowerPoint, along with more direct reading and writing instruction. Reading, writing, and technology intertwined as the project progressed and students reacted positively to instruction that combined them. Students' reading fluency improved with accuracy, expression, and prosody as a result of the project. The project however, did not appear to improve all students' reading rate. Even though there were some logistical problems with the technology and troubleshooting issues, those problems did not appear to negatively affect the outcome of the project.

The unanticipated findings from the study suggested the project affected more than just reading fluency and student attitudes towards literacy. Writing became the central focus of the project. It is not clear whether this happened because of the technology or because of the story writing activity. This shift occurred gradually and happened by students' desire to continue the writing process. This shift towards writing did not keep students from the project's instructional goals of reading fluency. Another unanticipated finding was that the students responded positively to using the technology, even when the technology was not the center of instruction. This suggested that using the technology may have contributed to the positive reaction to reading and writing.

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APPENDIX A: DATA RECORDING FORMS

A1. Reading Fluency Rubric

RubiStar

*Reading Fluency Assessment*Teacher Name: **lawyer**

Student Name: _____

CATEGORY	4	3	2	1
Rate	Reads at 50 wpm or above	Reads between 40-50 wpm	Reads between 30-40 wpm	Reads under 30 wpm
Accuracy	Reads at 97%-100% accuracy	Reads between 94%-97% accuracy	Reads between 90%-94% accuracy	Reads under 90% accuracy
Expression	Uses phrasing in meaningful chunks. Groups words quickly. Expression is effortless.	Sometimes uses phrasing in meaningful chunks. Groups words. Expression is not always automatic but is effective.	Uses phrasing but not in appropriate chunks. Groups words slowly. Expression is not effective.	Does not use phrasing. Groups words slowly or not at all. Expression is not used.
Prosody	Varies pitch and intonation. Emphasizes words appropriately. Always uses textual reading cues.	Usually varies pitch and intonation. Emphasizes words appropriately. Uses textual reading cues most of the time.	Rarely varies pitch and intonation. Words are rarely emphasized appropriately. Uses textual reading cues only some of the time.	Does not vary pitch and intonation. Words are not emphasized. Textual reading cues are not used.

A2. Student Attitude Scale

Name: _____

Date: _____

Student Survey

Circle the picture under each statement that best tells your feelings about the statement.

1. How I feel about myself as a fluent reader



2. How I feel about myself as a member of a group



3. How I feel about using the computer to create projects



4. How I feel about using the computer to practice reading stories



5. How I feel about myself as a writer



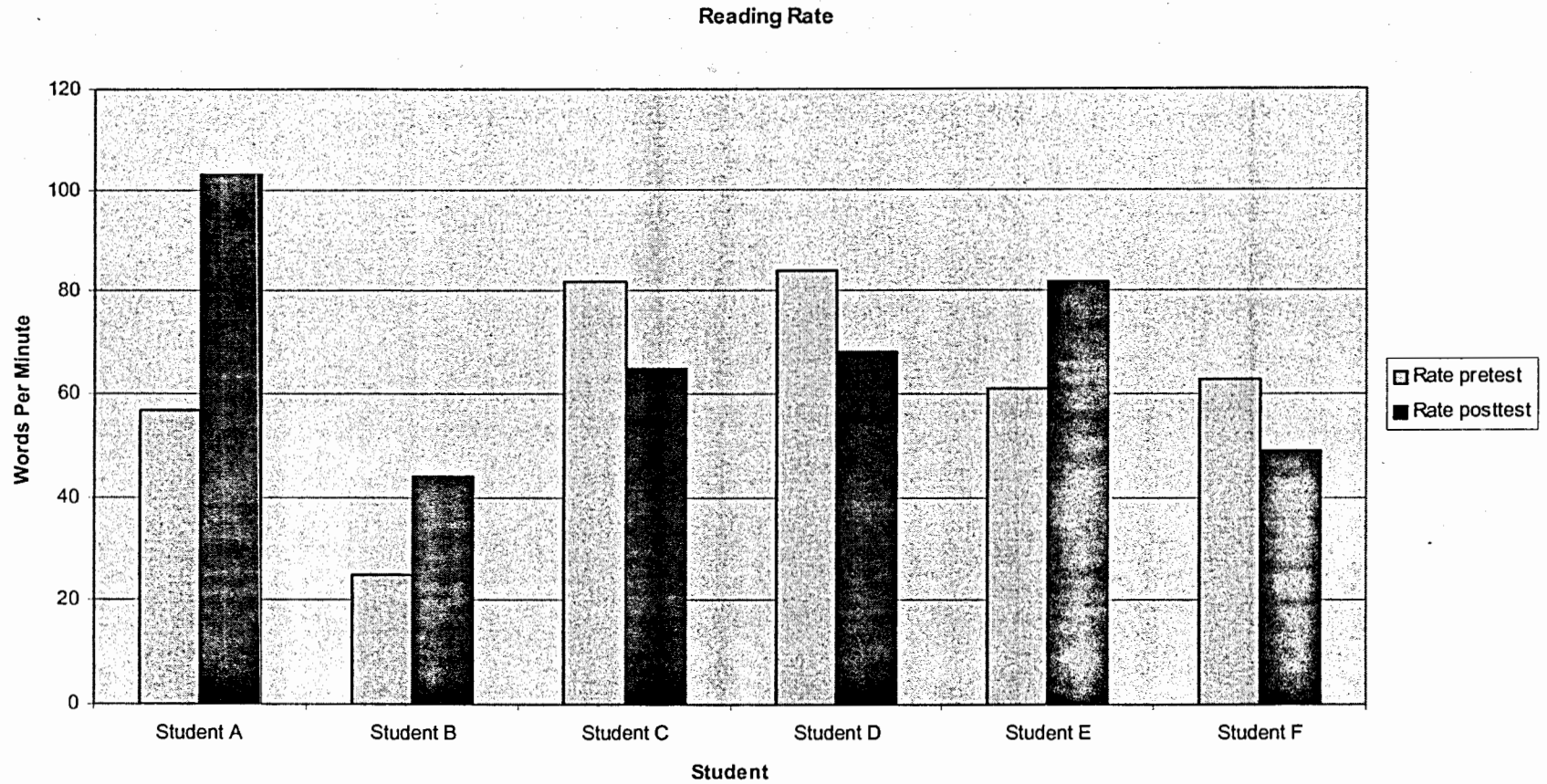
A3. Project Documentation Log

Date: _____
Time lesson started: _____
Time lesson ended: _____
Name of lesson: _____

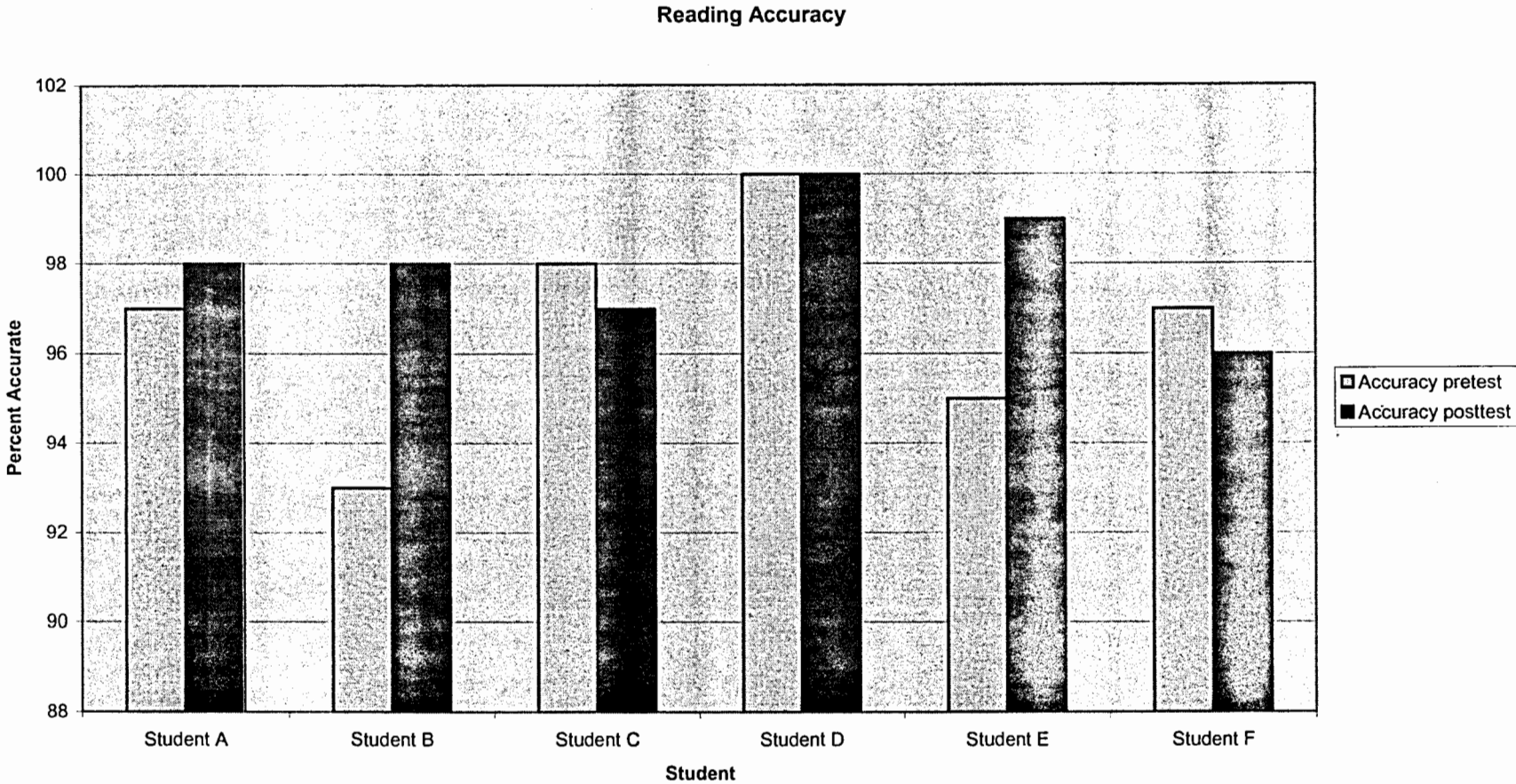
Lesson Description/Goals	Observations	Questions	Comments

APPENDIX B: RESULTS OF STUDY

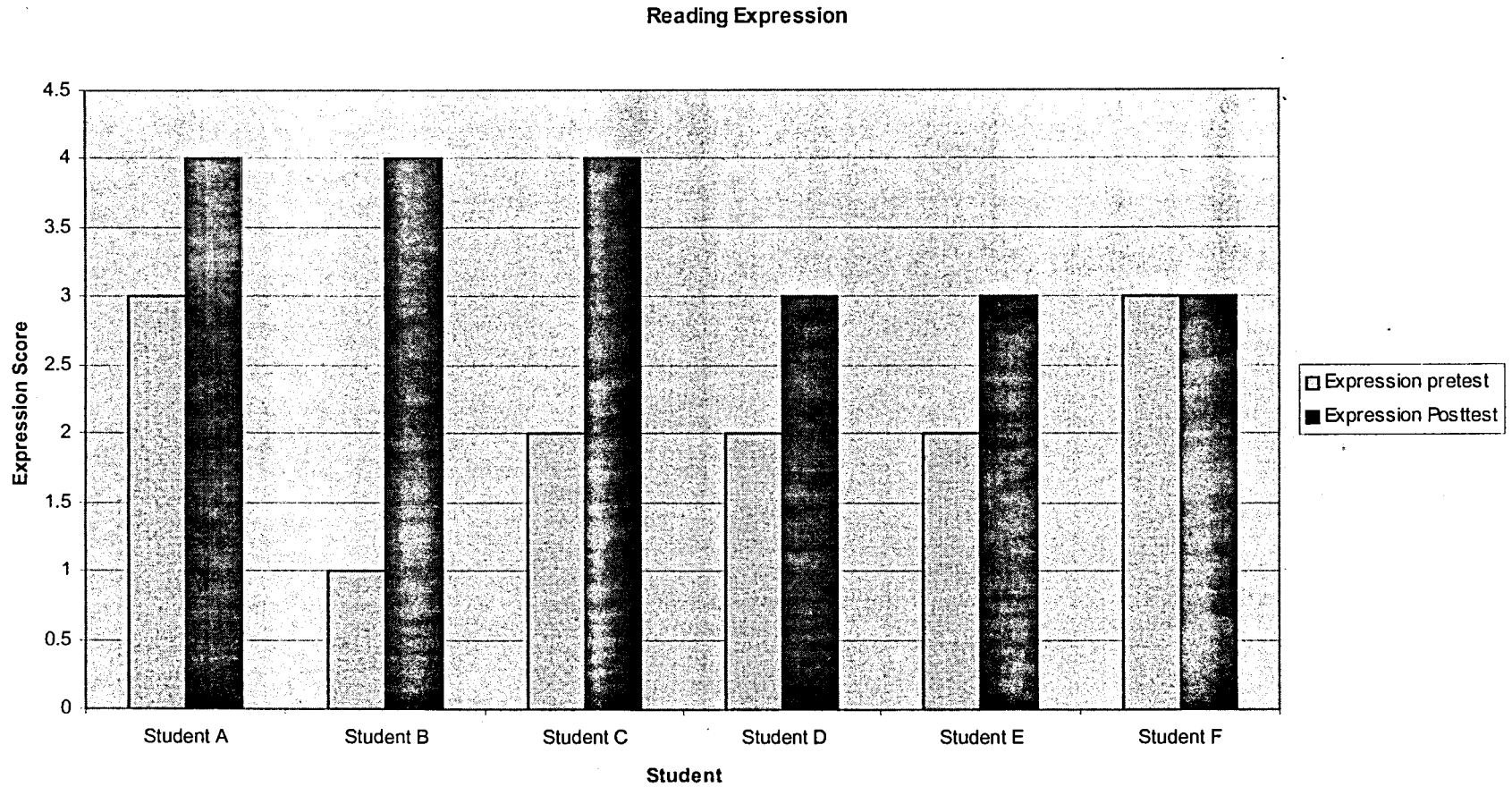
B1. Comparison of Pretest and Posttest Reading Rate



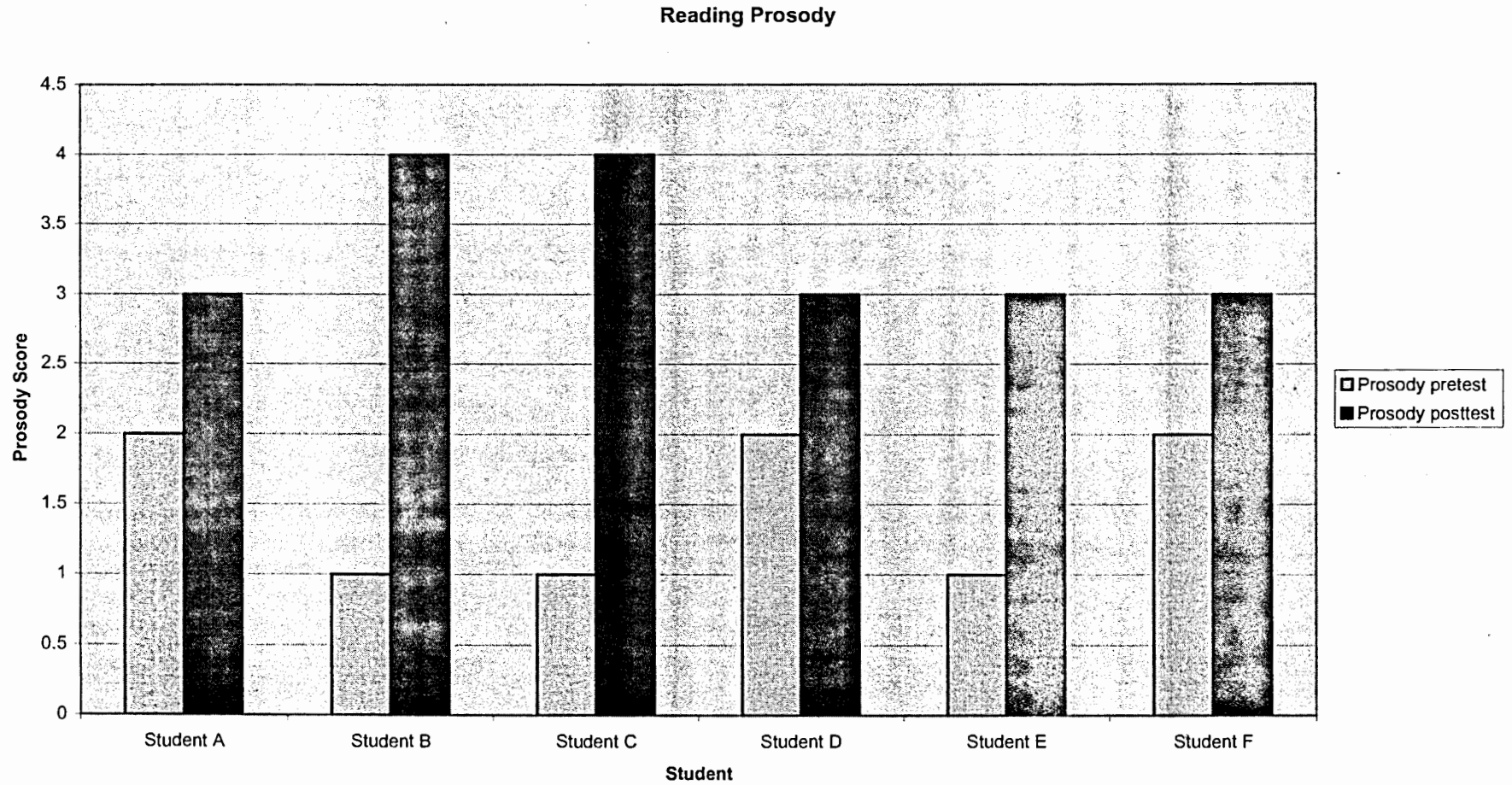
B2. Comparison of Pretest and Posttest Reading Accuracy



B3. Comparison of Pretest and Posttest Reading Expression



B4. Comparison of Pretest and Posttest Reading Prosody



APPENDIX C: STUDENT SAMPLE OF POWERPOINT SLIDESHOW

APPENDIX C: STUDENT SAMPLE OF POWERPOINT SLIDESHOW

