

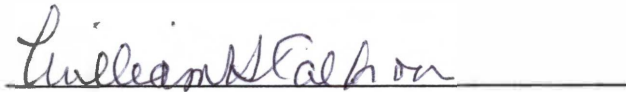
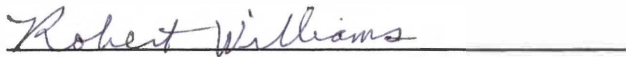
To the Graduate Council:

I am submitting herewith a dissertation written by Eden Michelle Abramson entitled "The Development of Target Skills with a Computer Component." I have examined the final paper copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Education.



Christopher H. Skinner, Major Professor

We have read this dissertation
and recommend its acceptance:



Accepted for the Council:



Vice Provost and Dean of
Graduate Studies

THE DEVELOPMENT OF TARGET SKILLS WITH A COMPUTER
COMPONENT

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Eden Michelle Abramson
December 2002

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Thesis
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DEDICATION

This dissertation is dedicated to my parents, Claudia and Robert Abramson, not only for their help in completing this process, but also for their continuous support and love. I am a product of my upbringing and I thank them for encouraging me to always reach higher – they are tremendous role models.

I am so proud to be their daughter.

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ABSTRACT

Existing research indicates that effective writing is critical to learning and that the use of computer technology in writing instruction can impact student performance. However, researchers have not provided information about the impact of computer-based programs on the acquisition of specific writing skills. To address the topic of specific skill acquisition, this study examined the impact of computer-based practice on a writing curriculum as measured by adjective and adverb usage in writing samples.

Participants were students from three seventh-grade English classes in an East Tennessee public school. They were randomly divided into two groups. On a weekly basis, each group alternated using pencil and paper and computer-based word processing for writing practice activities. Effective instructional components, such as feedback, scaffolding, and opportunities for active responding were included in both practice situations. Performance on pre-test and post-test writing tasks was measured.

The results indicate that the difference in overall adjective and adverb use, as well as word count, between the two practice options was not significant. However, adverb use increased for both groups from pre-test to post-test writing samples. These results suggest that practice opportunities can enhance the use of recently learned writing skills and that the effectiveness of these practice opportunities is similar across pencil and paper

and computer-based responding. The discussion focuses on limitations of the current study and directions for future research.

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Chapter I

Introduction

Though the identification procedure and resulting special education certification for writing deficits vary across the United States, research suggests that writing difficulties occur as frequently as all learning disabilities. The prevalence of writing deficits among school-aged children is approximately 5% of the population (Luttinger & Gertner, 2001). This is a serious concern because much of what children learn in school is assessed through a written product (Christenson, Thurlow, Ysseldyke, & McVicar, 1989; Graham & Harris, 1988). Writing deficits may impede students' ability to translate their knowledge into writing, compose within short intervals, and readily select words (Berninger, Mizokawa, & Bragg, 1991).

Writing deficits can be remedied with instruction and practice. Particularly, writing skills may be enhanced with both instructional time and practice devoted to the writing process (Christenson et al., 1989). In addition, allowing students to write freely and receive feedback has been shown to improve writing skills and handwriting ability (Greenwood, Delquadri, & Hall, 1984; Kerchner & Kistinger, 1984). By requiring students to create written products, teachers can determine if students are making the desired responses and progress.

A large number of educators continue to expect compositions to be handwritten. However, research indicates that the quality of written output may

be enhanced through the use of computers and word processing programs. Word processing allows students to revise more easily, without recopying, through editing features (MacArthur, 1988; MacArthur, 1996; MacArthur & Shneiderman, 1986). Furthermore, students produce neater work, without erasures and other factors impacting legibility (Anderson-Inman, 1991; MacArthur, 1988; MacArthur, 1996; MacArthur & Shneiderman, 1986). The process of keyboarding may also be easier for many students than the laborious and sometimes difficult process of handwriting (Harrell, 1998; MacArthur, 1988; MacArthur, 1996; MacArthur & Shneiderman, 1986). Students also show an increase in the volume of their writing as well as time spent writing when using computers (Cochran-Smith, Paris, & Kahn, 1991; Hunter, 1991; Kane, 1983).

While computers and word processing programs appear to have many advantages, no investigation has been made into how their use during drill and practice procedures can enhance the application of recently taught writing skills. Based on the aforementioned benefits of computers and word processing programs, one might expect an improvement in certain target skills. These were the skills (e.g., the use of adjectives and adverbs) targeted for instruction and practice in this study. Operational definitions for adjectives and adverbs can be found in Appendix B and D (see Haley-James & Stewig, 1990).

Word processing programs may allow students to practice newly learned skills in a manner that enhances writing performance more than do typical pencil-and-paper writing tasks. The primary purpose of the current study is to investigate whether computer-based practice opportunities (specifically the use of word processing programs) increase the number of adjectives and adverbs, as well as the number of words, in written composition.

Adjectives and adverbs were chosen as appropriate target skills for this study because of the ease in which they could be inserted during the editing process when using a word processing program. They also were identified as appropriate for the students' skill level.

Hypotheses

1. (Directional) When practicing writing with a word processing component, there will be a significantly greater number of adjectives written than when practicing with pencil and paper.
2. (Directional) When practicing writing with a word processing component, there will be a significantly greater number of adverbs written than when practicing with pencil and paper.
3. (Directional) When practicing writing with a word processing component, there will be a significantly greater number of words written than when practicing with pencil and paper.

Definition of Terms

1. Target skills – In this study, target skills are those skills chosen by the researcher for instruction and practice. The target skills were adjectives and adverbs.
2. Adjectives – Words that modify nouns or pronouns (see Appendix B for Operational Definition).
3. Adverbs – Words that modify verbs, adjectives, or another adverb (see Appendix D for Operational Definition).
4. Word count – The number of words correctly written, correct words are those which are recognizable, even if misspelled (see Appendix F for Operational Definition).
5. Computer-based practice – Practice employed using a word processing program and keyboarding.
6. Word processing program – A computer program, including editing components, designed for the writing of compositions. In this study, students used Word Pad.
7. Pencil and paper practice – Practice using a pencil as a writing instrument and paper formatted with lines and the story starter.
8. Story starter – A sentence fragment designed to initiate an idea for written composition (e.g., I never expected that one day I'd open my closet and find...).

Chapter II

Review of Literature

Literature on the process of writing typically addresses three areas: skills required for writing, assessment tools to identify writing deficits, and components of writing instructional strategies. All three areas impact the acquisition and remediation of the writing process. It is within the area of writing instructional strategies that computer technology is discussed as a method of enhancing the production and enjoyment of writing.

Skills Required for Writing

The process of writing is viewed as a three-level hierarchy of skills (Berninger et al., 1991). Each successive skill in the hierarchy is a necessary prerequisite for the acquisition of the skill at the next level. Inadequate development of any of the skills can contribute to the onset of writing deficits.

The skill at the first level of the writing process is the rapid and automatic production of letters of the alphabet, an ability that usually develops during the primary grades. Three neurological variables appear to affect this skill (Berninger et al., 1991). The first variable is the ability to retrieve letter symbols from visual memory. Some children are unable to automatically produce letters from memory, which draws cognitive energy away from more advanced writing skills, such as producing words and sentences.

The second neurological variable affecting the production of alphabet letters is fine motor ability (Wolff, Gunnoe, & Cohen, 1983). Fine motor

deftness is associated with penmanship. Undeveloped fine motor skills may interfere with handwriting capabilities (Berninger & Colwell, 1985) and result in frustration in learning and practicing writing skills. Students may write less because of the time required to hand-write words and their own observation of the quality of their written products.

The third neurological variable that affects letter production is visual-motor integration, combining visual memory and fine motor capabilities. Since writing is the expression of thoughts, this integration issue can be a serious roadblock to gaining writing skills. Without the ability to use words for self-expression or to recall information, writing can become tedious and laborious.

The second and third of the three hierarchical levels of the writing process discussed by Berninger et al. (1991) develop during the intermediate grades. One is the production of words, sentences, and paragraphs. The other is the use of cognition for planning, translating, and revising (Hayes & Flower, 1980). Children typically master this third skill level after age twelve (Perfetti & McCutchen, 1987).

Remediation of writing deficits may be necessary at more than one level. Under such circumstances, it is important to begin by addressing the first level skill to promote automaticity. Only after remediation of this skill deficit can cognitive energy be applied to the higher levels (Berninger et al., 1991; Graham & Harris, 1982).

By the intermediate grades, most students have developed the necessary mechanics of writing. However, students with learning deficits who have not mastered lower-level skills will continue to struggle with higher-level processes (Graham, 1990). Applying excessive cognitive energy to the mechanics of writing leaves little energy available for the development of a substantive writing product, which leads to errors and incoherence. Furthermore, difficulties with the mechanical aspects of writing may decrease the rate of written production. Due to the slow production of text, students may not be able to keep up with their thoughts and their initial plans for a piece of writing. Students may also use simpler words if unsure of the spelling of more difficult words (Graham, 1990). Overall, difficulties with lower-level skills, the mechanics of writing, may eventually impact motivation and investment in the writing process.

Assessment Tools to Identify Writing Deficits

Much of the research on writing deficits has been initiated by educators. Only recently have psycholinguists and cognitive psychologists pursued research in this area (Berninger et al., 1991). One factor hindering research on writing deficits has been the absence of an effective instrument to diagnose writing skills in terms of identified deficits (Berninger et al., 1991). Currently, measures available for assessing writing achievement include the *Test of Written Language - Third Edition* (Hammill & Larsen, 1996) and the Written Language Achievement Cluster of the *Woodcock-Johnson Psychoeducational*

Battery – Third Edition (Woodcock, McGrew, & Mather, 2001). These instruments are used in combination with intelligence tests to determine whether an ability-achievement discrepancy exists.

These tests alone, however, do not indicate a writing deficit and do not specifically determine what level of the writing process might need attention. Just as there are three skill levels involved in gaining writing fluency, there are three types of writing deficits related to the hierarchy (Berninger et al., 1991). The first type of deficit is difficulty in translating knowledge into writing. The second is a need for extended composing time. The third is difficulty in selecting words. Writing achievement measures alone are unable to identify these specific deficits, and there are currently no other standardized assessment tools with this capability.

Components of Writing Instructional Strategies

Many educators believe that students should learn to read and spell correctly before focusing attention on writing skills (Kerchner & Kistinger, 1984). In attempting to remedy reading and spelling errors before beginning writing instruction, teachers lose precious time and practice in written expression. This is especially detrimental for those students with learning deficits who may not have mastered reading. Researchers are discovering that the lack of attention devoted to writing instruction in the early years of education impedes the development of written expression skills in students both with and without learning deficits (Kerchner & Kistinger, 1984). Yet many

special and general education teachers agree with the theories of Myklebust (1965). These theories suggest that children develop an understanding of spoken language before they can speak and that they learn to read before they write. The later work of the linguist Carol Chomsky (1971), however, indicated that reading programs are out of sequence. Children appear to encode material more easily than they can decode it. This suggests that writing should be taught either alongside or prior to reading, and that educators should increase the time they devote to writing instruction.

Instructional time. An important variable to consider when providing writing instruction is the allocation of instructional time. Teachers seldom schedule enough time for writing instruction (Christenson et al., 1989; Graham & Harris, 1988). In order for students to develop their writing skills, they need time to practice such skills. Since students demonstrate their knowledge in school primarily through written responses (Christenson et al., 1989), they may fail to keep pace with classroom learning when given inadequate time to express their knowledge, thoughts, and ideas (Graham, 1982). Limitations in writing time may hinder their writing skill development.

Another variable is the scheduling of writing activities (Montague & Leavell, 1994). Because attention to task is an important consideration, it may be useful for teachers to offer writing lessons at a time in the school day when student attention is generally normally high. By scheduling activities when maximum focus is likely, and then setting a series of limited expectations,

teachers enable students to reach reasonable goals more easily and help them avoid frustrations that might harm progress toward the longer-term goal of attaining writing expertise.

Types of writing activities. An important aspect of writing instruction is choosing the right type of writing activities. Students can benefit from writing freely, rather than merely completing worksheets or performing rote activities (Kerchner & Kistingner, 1984). A proven instructional approach is to promote creative writing to increase the length and fluency of writing samples. The writing of journal entries, personal narratives, or essays on a topic of the student's choosing may also encourage interest and fluency in writing (Graham & Harris, 1988).

A further variable is the consideration given to students' prior exposure to the material (Montague & Leavell, 1994). The more familiar they are with the content of an assignment, the more effort they can devote directly to their writing. Similarly, instruction that motivates students through the presentation of interesting topics may improve learning.

Additional writing practice may also promote fluency in handwriting (Graham & Weintraub, 1996). By encouraging students to write freely, teachers ensure that students enjoy writing more and consequently spend more time working on enhancing their production (e.g., handwriting) skills. Although these methods of written expression less frequently call for high-level writing skills—because much of the information is readily available in the

student's memory—they require less energy for formatting and framing that information (Bereiter & Scardamalia, 1982) and so encourage more fluid production and volume.

Scaffolding. A number of variables in how writing instruction is presented were also identified as important to the promotion of skill development. One instructional option relates to the amount of teacher support provided. Since writing ability differs among students, individual students may require different levels of assistance. Using writing activities that develop the cognitive skills needed for good writing will help improve the performance of students with varying ability levels (Graham & Harris, 1988). In addition, the provision of opportunities for interaction between teachers and students, such as scaffolding or guided assistance, was found to be beneficial (Berninger & Stage, 1996).

Students generally do not implement instructional strategies simply because they are told to do so (Stein, Dixon, & Isaacson, 1994). Therefore, an essential component of instruction is scaffolding. In the case of writing instruction, this component denotes any procedure designed to provide structure for the desired instructional strategy. Providing an initial support framework increases the likelihood of students successfully implementing strategies. As students effectively maneuver through the writing process with the aid of scaffolding, they may eventually achieve independence and no

longer need the support or scaffold they originally required (Graham, Harris, MacArthur, & Schwartz, 1991).

Opportunities to respond. In addition to the instructional strategies mentioned in the previous paragraphs, a key element to improving academic behavior is providing “opportunity for respond” (Greenwood et al., 1984). Teachers can create these opportunities by encouraging active responses such as the production of writing samples, reading aloud, or answering questions. Such responses have been shown to enhance learning (Greenwood et al., 1984). By incorporating these activities into academic instruction, teachers can assess the progress being made by each student, while students are encouraged to be more responsible for their own education through more active participation in instructional activities. Opportunities to respond can be improved by increasing practice and time on task (Greenwood et al., 1984).

In addition, certain antecedent events may enhance academic responding. These include systematic scheduling of instructional time, the use of materials that promote the desired academic responses, and the pattern of interaction with students a teacher develops within the classroom. Traditional thinking is challenged by the notion that students’ education is improved when they are given opportunities to respond. A quiet, attentive student may not benefit most from activities lacking active participation. In fact, such a student may not be responsive to the teacher's academic instruction, and, therefore,

may not be acquiring necessary information (Hall, Delquadri, Greenwood, & Thurston, 1982). Opportunity-to-respond tactics encourage the active involvement of students in their own education, which in turn increases their skill development. By changing their instructional approaches to enhance student response, teachers can assist students in making dramatic academic gains (Greenwood et al., 1984).

Learning rates. Academic learning is also affected by adjusting the time allocated for task completion. One study demonstrated that reducing the time allowed to complete 20 math problems from 20 minutes to 5 minutes actually increased the number of problems students completed (Van Houten & Little, 1982). In another study, multiple components of an intervention, including timing and feedback, public posting, and praise, were added (Van Houten, Hill, & Parsons, 1975). As each component was added to the intervention, measures of the student's compositional writing improved, including the rate of words written.

Instruct-practice-feedback. Few teachers implement daily writing activities because of the time required to read and correct numerous writing samples (Heward, Heron, Gardner, & Prayzer, 1991). However, there are ways to minimize this obstacle. Through a process of "selective grading," all students can write daily and the teacher need read only 20% to 25% of each day's writing samples. The samples of student work that have been reviewed by the teacher are returned every day and portions of these papers are used

during a subsequent writing instruction session. After the instructional session, students complete a new writing assignment comprised of a specified number of target elements predetermined by the teacher and based on their previous performance. For successfully reaching designated goals, students can be awarded points used to increase their own final grade or to benefit the entire class. Points or other rewards can be used as incentives. This instructional strategy lets teachers critique at least one writing sample from each student every week, without being overwhelmed by the prospect of reviewing 20 to 30 writing assignments each day.

Such a selective grading method integrates scaffolding and the concept of opportunity to respond. Given fewer assignments to review, teachers can focus more attention and care on each individual student's work. Although the selective grading strategy was implemented in only three classrooms, the results were encouraging (Heward et al., 1991).

Application of Computer Technology in Writing Instruction

Computers began appearing in classrooms in the early 1980s when the introduction of personal computers decreased the cost of computer ownership (Forester, 1987). Personal computers offered such capabilities as word processing, spell checking, grammar checking, and speech synthesizing (Zorfass, Corley, & Remz, 1994). As early as 1982, a software program called *Computerized Spelling Remediation Program* (CSRP) was tested on students and found to be helpful (Hasselbring, 1982). This program, which is based on

an imitation strategy, provided students with modeling and feedback while they practiced spelling.

By the mid 1980s, predictions arose that computer literacy would become the fourth key academic skill, in addition to reading, writing, and arithmetic (Forester, 1987). In fact, the notion that computers would eventually replace pencils was already being discussed. An instrumental figure in encouraging the use of computers in education was Seymour Papert. He asserted that by simply learning to use computers, educators could change the way students learned other material (Papert, 1980). Papert developed the Turtle, a computer-controlled cybernetic animal, which was directed to move by the LOGO computer language. Students working with LOGO learned a language for discussing shapes and rates of change, as well as problem solving processes and procedures for using computers. Unwittingly, students were being introduced to the language of math. Over time, Papert's vision of computer use in education began to take hold, as greater numbers of computers entered the classroom and the increased use of computer-aided instruction fundamentally altered many subject areas.

Although there are multiple educational uses for computers, a primary application is word processing, which is performed with software programs designed to produce text documents. Word processing influences the writing process in many ways. Editing features allow easier revision, without recopying, which produces work that appears neat and legible (Anderson-

Inman, 1991; MacArthur, 1988; MacArthur, 1996; MacArthur & Shneiderman, 1986). The ability to easily revise written products by removing the mechanical difficulty of editing may impact the length and number of revisions of a sample (Bangert-Drowns, 1993). The production of text becomes a fluid and readily alterable form of communication, making writing more similar to thinking and speaking. In addition, word processing software eliminates the difficulties and embarrassment that surround handwriting. The final product of a word processing session generally contains fewer errors than a handwritten piece (Cochran-Smith et al., 1991). In addition, the process of keyboarding is frequently easier for many students than the laborious and sometimes difficult process of handwriting (Harrell, 1998; MacArthur, 1988; MacArthur, 1996; MacArthur & Shneiderman, 1986). Once students have developed basic keyboarding skills and an understanding of the editing features of the software they are using, they can be more successful and more involved in their writing.

Another important and less frequently appreciated benefit of the use of computers in the writing process is the enhanced visibility of what is written (Hunter, 1991; MacArthur, 1988; MacArthur, 1996; Zorfass et al., 1994). Students working in groups or teachers walking by can view the written product on the computer screen more clearly than when the same product is handwritten on paper (MacArthur, Graham, & Schwartz, 1993). The accessibility and clarity of writing is a substantial benefit for teachers, helping them provide feedback and monitor progress with relative ease. For the

students, screen visibility means less interference in the writing process from indecipherable penmanship (MacArthur, 1996).

Further enhancing the effectiveness of the use of computers in the writing process, word processing software can be individualized to meet the specific needs of each student (Ellsworth, 1990). One example of individualization is the ability to create a template which formats text size and spacing (Stueben & Vockell, 1993). Each time a student uses the word processor, the individualized template makes the process easier and more uniform. The student does not need to configure the document, only write within its preset framework.

A further benefit of individualized templates is their ability to facilitate the formatting of text produced by students with learning deficits (Stueben & Vockell, 1993). For example, such students' templates might include a larger letter size and more spacing between words at the beginning and ending of sentences. These formatting aids may help students with learning deficits perform at a level similar to that of their peers.

There are some practical limitations to template use. Font size must be controlled so that any increases in size do not affect the fluidity of the work (Stueben & Vockell, 1993). Teachers may not have adequate time to create individualized templates or they may be unfamiliar with computer technology or particular software applications and thus are unable to meet their school's technology expectations (Ellsworth, 1990). Without a clear understanding of

the capabilities of word processing software, a teacher's creation and use of templates may not result in improved instruction.

However, simply placing computers in front of students does not ensure that student writing will improve. Poor writers will not be transformed into wordsmiths merely through the use of a word processor (Cochran-Smith et al., 1991). Furthermore, keyboarding may be a new skill for many students, requiring attention to typing and software usage rather than the writing process itself (Bangert-Drowns, 1993).

Even with such limitations, researchers have identified a number of benefits to word processing (Anderson-Inman, 1991; Harrell 1998; Hunter, 1991). Students show an increase in both the volume and the duration of their writing activities (Cochran-Smith et al., 1991; Hunter, 1991; Kane, 1983). Because students with writing difficulties often generate significantly shorter compositions, the potential for increased volume produced on computers is a tremendous benefit to this particular population (Graham et al., 1991). In instructional contexts, students also revise more when composing on a computer than when writing by hand (Cochran-Smith et al., 1991). They appear to monitor and reread their work more often; their attitude toward writing thereby improves through the use of computers. Moreover, seeing their work and ideas on a computer screen often motivates further effort (Anderson-Inman, 1991). The ease with which computers can present instruction and guidance repetitively is particularly helpful for students with learning deficits,

who often benefit from repeated drills and practice (Harrell, 1998). Finally, the use of computers allows students to save their ideas and return more easily to past writing efforts.

Studies also show that students generally benefit from the integration of word processing with the strategies described earlier in this paper, including instruction in planning, writing, and revising (Hunter, 1991; MacArthur, Schwartz, & Graham, 1991). An effective approach involves matching word processing technology with the specific needs of each individual student (Stueben & Vockell, 1993). Without creating a dependency on computers, students can use them to enhance individual strengths and minimize deficiencies (Anderson-Inman, 1991).

Teachers appear to be pleased with how computers aid student progress. There is an overall sense that students who use computers are more absorbed in their work (Holzberg, 1994). Teachers recognize that computers can improve student interest and encourage creativity. They try to find ways to transfer this student enthusiasm to other classroom activities. Research shows that the auxiliary benefits of computer-aided instruction further promote teacher support for its use. Improved composition and written language skills resulting from the use of word processing programs do translate into improved performance on pencil-and-paper tasks (Kerchner & Kistinger, 1984).

Summary and Purpose

This review of literature on the writing process reveals that effective components of writing instruction include instructional time, engaging materials, scaffolding, opportunities to respond, and feedback (Berninger & Stage, 1996; Greenwood et al., 1984; Heward et al., 1991; Montague & Leavell, 1994; Van Houten & Little, 1982). Additionally, researchers have found that students enjoy working on computers, and that they write more—and demonstrate more creativity—when using computers as learning tools (Anderson-Inman, 1991; Harrell, 1998; Hunter, 1991). However, there is no research available to indicate whether an increase both in word production and grammatical usage occurs when computer-aided writing programs are used. Studies are needed to determine whether the benefits of using a computer and word processing software will translate into improvements in certain target skill usage.

The current study attempts to demonstrate how the use of two different methods of practicing writing affects the development of a specified set of target skills. The first method utilizes pencil and paper, while the second employs keyboarding and a standard computer-based word processing program. Included in both methods are effective instructional components, such as feedback, scaffolding, brief time intervals for task completion, and opportunities for active responding. It is expected that the writing samples composed by students using the word processing component will show a

greater increase in target skill use and word count than those samples created by students who used only pencils and paper.

Chapter III

Methodology

Participants

The participants were students from three seventh grade English classes in a rural East Tennessee public school. There were 21 males and 27 females ranging in age from 12 to 15. The first class was composed of 5 males and 13 females, the second class of 9 males and 5 females, and the third class of 7 males and 9 females. Data collection began once parent/guardian consent and student assent were obtained. Participants were assured of confidentiality through the coding of writing samples. All interactions and data collection took place during English class time, which occurred before lunch for all three classes. Students remained in their classroom for all procedures.

Participants were comfortable using computers. Their English teacher reported that they all had prior exposure to keyboarding and word processing software and were currently involved in the same writing curriculum. The 13 IBM®-compatible personal computers in the classroom and the Word Pad word processing program were frequently used as part of weekly instruction and curriculum objectives. Though students were not expert in either keyboarding or word processing, their teacher reported that they did have sufficient skills to produce writing samples using the Word Pad word processing program.

Setting

The classroom had 30 chairs arranged in rows, all with attached desktops. The chairs faced toward the front of the classroom, where the teacher's desk and a dry erase board were located. Three computers were located in the front of the room, with the remaining computers located in the back of the room against the rear wall. Instruction and dissemination of materials was conducted from the front of the classroom, with the dry erase board used to provide examples.

Design

A pre-test/post-test comparison group design was used to evaluate the intervention and determine if practice on the word processing program increased the target skills more than practice with pencil and paper. Within each class, students were randomly assigned to one of two groups. Each group, in each classroom, would alternate working one week on the computers and one week with pencil and paper.

Dependent Variables

The study measured the following three skill variables:

1. The median (i.e., each student's middle score on the three pre-test writing samples and again for each of the three post-test writing samples) number of adjectives, target skill #1, used correctly by each student on the pre-tests and post-tests was tallied using the operational definition in Appendix B and the scoring criteria in Appendix C.

2. The median number of adverbs, target skill #2, used correctly by each student on the pre-tests and post-tests was tallied using the operational definition in Appendix D and the scoring criteria in Appendix E.
3. The median word count of student writing samples, from the pre-tests and post-tests, was tallied using the scoring criteria in Appendix F.

Independent Variable

The primary purpose of this study was to compare target skill development resulting from computer word processing activities and pencil-and-paper activities. Students in each English class, randomly divided into two groups, alternated these activities on a weekly basis. Every group participated in pre-tests and post-tests for each of the target skills. This study attempts to determine whether, given a constant degree of daily writing opportunities, a significant difference exists in the development of particular targeted skills as a result of the tools used in practice activities.

Procedure

Student names remained on all writing samples so the samples could be used as part of the seventh grade ongoing English curriculum. However, to keep participants' identities confidential, all names were changed to numbers for the research data.

Day One of Week One began with a pre-test on adjectives, which was target skill #1. Each student was given three different story starters (see Appendix G). All students in all classes received the same three story starters,

one at a time. For each story starter, the students were asked to think about what they wanted to write for one minute and were then directed to write for three minutes (Shapiro, 1996). A stopwatch was used to determine when students should start and stop writing. All students composed their writing samples using pencils, on paper preprinted with each story starter. All writing samples for each story starter were collected before the next paper was distributed. The objective of the pre-test was to gather data on the number of adjectives used correctly and on the total number of words written by each student. The guidelines and scoring criteria are included in Appendixes B, C, D, E, and F.

On Day Two of Week One, students in each classroom were randomly assigned to one of two groups for the remainder of the two-week study. Group A continued using pencil and paper, while Group B began using the Word Pad word processing software. For the remaining three days of Week One, all three classes continued with their regular English instruction with only slight variations. The investigator gave a brief review (approximately five minutes) on adjective usage. Students were praised for their attempts at incorporating this target skill into the writing they had just completed. Then, three examples of appropriate adjective usage were presented, each taken from student writing samples composed during the previous day. Once correct usage was reviewed, an example of incorrect usage, also taken from student writing, was provided. The class discussed how to correct the error. Finally, a sentence

from a student writing sample was chosen and used to discuss how to increase or modify the use of adjectives. The lesson ended with a reiteration of adjective rules and usage.

Following this instructional time, students were divided into their previously designated groups. Group B, the computer group, relocated to the computers around the classroom. After Group B students were situated at their computers and Group A students at their desks, both groups were provided with the same story starter. A new story starter was provided each day (see Appendix G). Group A was given a preprinted paper with the appropriate story starter and Group B had a word processing page open to a new document with the story starter already typed onto the page. The story starter was read aloud to both groups. Again, students were asked to think for one minute about what they wanted to write, paying special attention to using adjectives. After one minute, the students were directed to begin writing. They wrote for nine minutes, and if they finished early they were asked to continue writing until the writing time had ended. Both groups in all classes followed the same procedures and were provided with the same story starter.

As in Week One, Week Two began with a pre-test for target skill #2, adverbs. This pre-test was also used as the post-test for target skill #1, adjectives. The pre-test/post-test followed the same format as in Week One, except for the use of three new story starters (see Appendix G). During the

pre-test/post-test, the students were not given any instruction on the target skills or reminded of what to include in their writing samples.

The remaining four days of Week Two were much like those of Week One. There were only two changes. First, target skill #2, adverbs, was introduced and the instructional time was thus focused upon adverbs rather than adjectives. Second, Group A moved onto the computers while Group B switched to pencil and paper.

The first day of Week Three, which was also the final day of data collection, was the post-test for target skill #2, adverbs. The post-test followed the same procedures as those used in Week One and Week Two and included three new story starters (see Appendix G).

Data Analysis Procedures

The difference between pre-test and post-test performance of each dependent variable was assessed by a repeated measure Analysis of Variance (ANOVA). The within-subject factor was time, pre-test and post-test. The between-subject factor was method of composition, paper and computer. Randomization was incorporated into the treatment design to reduce the effects of extraneous variables (Ferguson & Takane, 1989). The ANOVA measured the difference between the group using pencil and paper and the group using word processor software across the data collection of adjective use, adverb use, and words written. Differences were considered significant at the $p < .05$ level.

Interscorer Agreement and Procedural Integrity

Interscorer agreement and procedural integrity data were collected during the study. A second investigator independently scored all three dependent variables on a randomly selected 20% of the pre-tests and post-tests. Interscorer agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. The total agreement for target skill #1, adjectives, was 94%. The total agreement for target skill #2, adverbs, was 92%. The total agreement for overall word count was 98%.

In an attempt to enhance procedural integrity, a checklist of procedures was developed for each day. The checklist included the presentation sequence, timing instructions, and appropriate directions for both the pre-test/post-test days as well as the daily writing practice days (see Appendix H). The principal investigator used the checklist to maintain accuracy and consistency of presentation throughout the study. The English teacher obtained interobserver agreement for 25% of the daily writing sessions. The second investigator obtained interobserver agreement for 100% of the pre-test/post-test days. On all occasions of interobserver participation and completion of the checklist, the agreement was 100%.

Chapter IV

Results

This chapter contains the results of the study. The first and second sections address the research questions associated with adjectives and adverbs, respectively. The third and final section addresses overall word count.

Adjectives

Table 1 displays the means and standard deviation for adjective usage for time (pre-test and post-test) and treatment (computer and paper). A repeated measure ANOVA was used to test for a time by treatment interaction effect and main effects. Table 2 displays the analysis of within-subject effects and Table 3 addresses between-subject effects.

Table 1 Means for Adjectives by Treatment

Treatment		N	Minimum	Maximum	Mean	Std. Deviation
Computer	Adjectives - Pretest	22	2	13	7.27	2.658
	Adjectives - Post test	22	2	13	7.50	3.036
Paper	Adjectives - Pretest	24	2	13	7.58	2.636
	Adjectives - Post test	24	4	13	8.25	2.345

Table 2 Within-Subject Effects for Adjectives

Effect	Wilks' Lambda	F	Hypothesis df	Error df	Sig.
TIME	.974	1.156 ^a	1	44	.288
TIME * TREATMENT	.994	.279 ^a	1	44	.600

a. Exact statistic

Table 3 Between-Subject Effects for Adjectives

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	5376.021	1	5376.021	521.485	<.001
TREATMENT	6.456	1	6.456	.626	.433
Error	453.598	44	10.309		

One purpose of this study was to determine if practice using a word processing program enhanced use of adjectives more than practice using pencil and paper. Table 2 shows that the time (pre-test and post-test) by treatment (computer and paper) interaction was not significant [$F(1, 44) = .279, p = .600$]. Additionally, Table 2 shows that the main effect for time was not significant [$F(1, 44) = 1.156, p = .288$]. These results suggest that neither form of practice (word processing or pencil and paper) resulted in significant increases in use of adjectives. Therefore, these data failed to confirm the hypothesis that practice with a word processing program would increase the use of adjectives more than practice with pencil and paper.

Analysis of between-subject effects displayed in Table 3 shows no significant difference [$F(1, 44) = .626, p = .433$]. This suggests that the two groups were similar in their use of adjectives throughout the study.

Adverbs

Table 4 displays the means and standard deviations for adverb usage for time (pre-test and post-test) and treatment (computer and paper). A repeated measure ANOVA was used to test for a time by treatment interaction effect and main effects. Table 5 shows within-subject effects and Table 6 shows between-subject effects.

Table 4 Means for Adverbs by Treatment

Treatment		N	Minimum	Maximum	Mean	Std. Deviation
Computer	Adverbs - Pretest	22	1	7	2.59	1.709
	Adverbs - Post test	22	1	6	3.41	1.501
Paper	Adverbs - Pretest	20	1	6	2.15	1.424
	Adverbs - Post test	20	1	7	3.00	1.487

Table 5 Within-Subject Effects for Adverbs

Effect	Wilks' Lambda	F	Hypothesis df	Error df	Sig.
TIME	.834	8.190 ^a	1	41	.007
TIME * TREATMENT	1.000	.000 ^a	1	41	.988

a. Exact statistic

Table 6 Between-Subject Effects for Adverbs

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	638.816	1	638.816	200.080	<.001
TREATMENT	6.444	1	6.444	2.018	.163
Error	130.905	41	3.193		

Analysis displayed in Table 5 indicates that there was no significant time by treatment interaction for adverb use [$F(1, 41) = .000, p = .988$]. However, there was a main effect for time [$F(1, 41) = 8.190, p = .007$], which showed that both groups increased their adverb use. Again, analysis of interaction effects failed to confirm the hypothesis that practice composition with a word processing program would increase the use of adverbs more than practice with pencil and paper. Results did suggest that both composition practice procedures might have caused an increase in adverb usage.

Analysis of between-subject effects displayed in Table 6 showed no significant difference [$F(1, 41) = 2.018, p = .163$]. This analysis suggests that the two groups were similar in their use of adverbs throughout the study.

Overall Word Count

Table 7 presents the means and standard deviations for word counts for baseline and after treatment. A repeated measure ANOVA was used to test for differences in word count using the first pre-test (for adjectives) as baseline. That baseline mean score was then compared with the mean post-

test scores of both the combined computer-treatment groups (from Week One and Two) and paper-treatment groups (from Week One and Two). Table 8 shows the results of this repeated measure ANOVA.

Table 7 Means for Number of Words by Treatment Order

	N	Minimum	Maximum	Mean	Std. Deviation
Baseline Word Count	41	21.00	72.00	45.7317	10.80746
Computer Word Count	41	24.00	79.00	46.1463	12.26899
Paper Word Count	41	26.00	77.00	48.0000	13.01153

Table 8 Repeated Measure ANOVA Testing for Differences in Word Count for Treatment Following Baseline

Effect	Wilks' Lambda	F	Hypothesis df	Error df	Sig.
TREATMENT	.920	1.706 ^a	2.000	39.000	.195

a. Exact statistic

Analysis displayed in Table 8 shows no significant differences in word count across baseline (first assessment) and following either paper or computer treatments [$F(2, 39) = 1.706, p = .195$]. These results suggest that the instructional and practice procedures used in this study did not increase word production rates.

Chapter V

Discussion

This chapter summarizes the findings of the current study. Conclusions and implications are described in terms of experimental procedures and dependent measures. General limitations of the findings are reviewed and followed by recommendations for future research.

Conclusions

The primary purpose of this study was to determine whether a significant difference in the use of adjectives and adverbs exists when two different daily practice procedures are provided to students; practice with word processing software and practice using pencil and paper. The results of the current study do not indicate a significant difference in the use of adjectives and adverbs between the two practice options. Additionally, neither practice procedure enhanced adjective usage or productivity, as measured by rate or word production. However, both treatment groups showed an increase in adverb usage following the practice sessions.

Limitations and Directions for Future Research

Before any conclusion can be drawn with respect to specific instructional procedures used in the current study or the mode of practice (i.e., word processing versus pencil and paper), future researchers should address several limitations. Threats to internal validity include testing effects, ceiling effects, and the lack of a control group. Additionally, future researchers should

address participant motivation and determine if pre-existing skill levels interacted with treatment effects.

Pre-test and post-test assessments required students to write using pencil and paper. Thus, those students whose practice activities were computer-based were required to use pencils and paper during the assessments. The study design called for the testing materials to remain constant, regardless of the practice tools. Though this decision removed a variable and focused attention on the two practice options, it required transference of the possible gains from word processing to pencil and paper. Future researchers should assess students, on pre-tests and post-tests, using both pencil and paper and computer generated writing samples to determine if generalization across practice and assessment response formats influences performance gains.

The scheduling of pre-tests, post-tests, and practice activities may have influenced results. In the current study, the pre-tests and post-tests were given following a weekend. Thus, the interval between practice activities and post-testing was approximately 36 hours. This delay between practice and post-testing may have deflated post-test scores. Future researchers conducting similar studies should consider reducing the delay between practice sessions and post-test assessment.

In the current study, the participants were not encouraged to use the target skills during pre-tests or post-tests. Future researchers should consider

instructing students to use target behaviors (e.g., adjectives and adverbs) in both pre-test and post-test assessments. This adjustment to testing procedure might assist the determination as to whether additional emphasis on the particular skills being targeted provides a better estimate of students' skill development.

An essential component of instruction is scaffolding (Stein et al., 1994). Scaffolding is intended to promote the successful implementation of the strategy (Graham et al., 1991). The scaffold provided in the current study consisted of the writing instruction, a uniform schedule of activities and directions, and the use of writing templates. In general, scaffolding should be removed gradually as students gain competence with the procedure. In the current study, although assessment procedures were similar to practice procedures, the consistent routine and instructions of the practice days were not applied to the pre-test and post-test sessions. This may have caused a contrast effect (i.e., interaction between treatment and assessment procedures) that decreased student performance during assessments. Future researchers should provide consistent scaffolding throughout the pre-tests and post-tests or gradually reduce scaffolding during practice routines to minimize the impact of this contrast effect.

Researchers have shown that teachers seldom schedule enough time specifically devoted to writing instruction on a daily or weekly basis (Christenson et al., 1989; Graham & Harris, 1988). In order for students to

develop writing skills, they must spend time practicing their writing. In this study, only five minutes were actually devoted to instruction and nine minutes to practice each day. Considering the average length of a school day, these time commitments may not have been sufficient. Future researchers may want to provide additional instruction and longer intervals of practice when conducting similar studies.

In the current study, the additional practice opportunities may have increased adverb usage but not adjective usage. Pre-test data showed that prior to instructional and practice procedures, the students used many more adjectives than adverbs (i.e., pre-test adjective mean was approximately 7.4 as compared to 2.3 adverbs). These findings suggest that ceiling effects may have influenced adjective, but not adverb, performance. Future researchers conducting similar studies should pre-test students in order to more clearly identify underdeveloped skills.

Although adverb usage increased, the failure to include a control group prevents researchers from ruling out other variables that may have accounted for this increase. Thus, various threats to internal validity may account for the increase in adverb usage. For example, testing effects (i.e., the opportunity to practice writing provided during the pre-tests) may have caused the increases. In order to control for threats to internal validity, future researchers conducting similar studies should include control groups that do not receive any practice or instruction.

In the current study, students were exposed to daily instructional procedures and different practice formats. Therefore, even if threats to internal validity were controlled, it would not be possible to conclude which specific components of the procedures (e.g., daily instruction or practice) caused the increases in adverb usage. Future researchers should consider conducting component analysis studies designed to indicate which components of specific writing programs impact student performance. For example, one group could receive only the new instruction while another could receive the instruction in addition to the practice opportunities.

Similarly, a sequence effect might impact the validity of findings. In this study two target skills were introduced sequentially, first the use of adjectives and then the use of adverbs. A confounding variable was created by changing the target skills mid-way through the study. Had either skill shown significant results, it would have been difficult to determine what aspect of the study caused the effect. The sequence of these two dependent variables alone could have produced the significance. To reduce a sequence effect, future researchers may want to focus on only one target skill.

Additionally, in the current study, the daily writing samples were not available for analysis. This prevented researchers from determining if either method of practice resulted in greater opportunities to respond or higher quality responses. Future researchers should print daily computer composition work and compare performance on these daily tasks to performance on pencil

and paper tasks to assess opportunities to respond under both practice conditions.

Motivation may have been a factor in student skill acquisition. In the current study, there were no incentives provided to participants or reinforcement provided for enhanced performance on daily tasks. These variables may have reduced student motivation. In addition, the story starters did not appear to engage the students adequately. More highly motivated participants might have been more diligent in their listening and writing, resulting in greater levels of improvement in the targeted skills.

The students' writing ability may limit the external validity of the current findings. Many of the students in this study had poor writing skills. To minimize the impact of previous writing experiences in any future study focusing on the role of technology in a learning environment, researchers may want to use subjects who are already well on their way to becoming competent writers.

Finally, students' computer experience and keyboarding skills may have influenced the current findings. As has already been noted, research indicates that simply placing computers in front of students does not ensure that their writing will improve (Cochran-Smith et al., 1991). Although the students in this study had prior exposure to keyboarding and word processing, their ability levels, efficiency, and comfort with word processing were not assessed in advance. Because poor keyboarding skills can distract students from the writing process, future researchers should pre-test participants to ensure a

minimum level of keyboarding and word-processing skills (Bangert-Drowns, 1993).

Summary and Conclusion

Research on the writing process reveals that effective components of writing instruction include sufficient instructional time, engaging materials, scaffolding, opportunities to respond, and feedback (Berninger & Stage, 1996; Greenwood et al., 1984; Heward et al., 1991; Montague & Leavell, 1994; Van Houten & Little, 1982). Among existing studies that involve the use of computers in writing instruction, there are indications that students enjoy working on computers and write more, with more creativity (Anderson-Inman, 1991; Harrell, 1998; Hunter, 1991). However, these studies did not measure the impact of computer use on the development of writing skills.

The current study attempted to determine how the use of two different methods of creating writing samples might affect a student's use of adjectives and adverbs, as well as the volume of their writing. The first method involved using pencil and paper to create writing samples, while the second employed keyboarding and a standard computer-based word processing program. Results suggest that neither method of producing writing samples results in superior writing performance across adjectives, adverbs, and production. However, before any applied conclusions are drawn, researchers should address limitations associated with the current study in order to determine

whether computer-aided instruction can substantially benefit writing instruction.

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APPENDIXES

Appendix A

*Form B**Application*

IRB# _____

Date Received in Office of Research _____

THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Application for Review of Research Involving Human Subjects

I. IDENTIFICATION OF PROJECT**A. Principal Investigator or Co-Principal Investigators**

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B. Project Classification: Research Project

C. Title of Project: The Development of Target Skills with a Computer
 Component

D. Starting Date: Upon IRB Approval

E. Estimated Completion Date: June 30, 2001

F. External Funding: N/A

II. PROJECT OBJECTIVES

The primary objective of this research project is to compare the development of target skills with and without word processing in a population of regular and special education students. It is hypothesized that students will learn and use target skills more quickly, effectively, and in greater volume when composing writing samples on a computer versus with pencil and paper.

III. DESCRIPTION AND SOURCE OF PARTICIPANTS

The participants for this research project will include students from three seventh grade English classrooms at Jellico Elementary School in Jellico, Tennessee. All of the students within the identified classrooms are between the ages of 12 and 15. The researcher will obtain consent from the students' parents or guardians for participation in the study as well as have the students complete an assent form. Data will only be collected on those students whose parents/guardians consent and who themselves assent to participate. The number of participants anticipated is approximately sixty-five students.

The rationale for using a student population is that they are currently required to write on a daily basis. In the designated English classrooms, the

students receive computer instruction concurrently with some of their writing activities.

Finally, the Principal Investigator is also a school psychologist in Campbell County. However, there is very little interaction between her and the seventh grade population in Jellico. Therefore, any unforeseen risks related to dual-role relationships are unlikely and if any do arise the Co-Principal Investigator will take over for those cases.

IV. METHODS AND PROCEDURES

Week #1 will begin with a pre-test on a certain target skill, target skill #1 (predetermined by the teacher and principal investigator). The target skills, two in total, will most likely be adjectives and adverbs. For the pre-test, the students will be given three different story starters. They will have five minutes to write, with paper and pencil, on each story starter. The story starters will be the same across classes. The object of the pre-test is to ascertain the number of target skill #1 used per number of words written.

For the remaining four days of Week #1, all three classes will continue with their daily writing with slight variations. First, a time limit for writing composition will be imposed. The students will be given fifteen (15) minutes in which to write. Second, the students will be provided with a story starter. Each classroom will be given the same story starter and the story starters will vary across days. Third, the students in each of the classrooms will be randomly assigned to one of two groups. Group A will continue with paper

and pencil composition throughout Week #1 and move onto computers during Week #2. Group B will begin on computers during Week #1, but switch to paper and pencil during Week #2. Although divided into similar groups, the students will remain in their classrooms throughout the study. There are thirteen computers located within the classroom.

Week #2 will begin the same way as Week #1 with the pre-test for target skill #2 also being used as the post-test for target skill #1. Week #2 will follow the same procedures as Week #1 with two variations. First, a new target skill will be introduced (ex. adverbs). Second, Group A and B will switch from paper and pencil to word processing or visa versa. The first day of Week #3 will be the post-test for target skill #2. The post-test will follow the same format as in Week #1 and Week #2.

The student's names will remain on their writing samples due to their classroom requirement. However, for inclusion in the research data, all names will be changed to numbers so as to keep the participant's identity confidential. Overall, the data collected will compare the number of correctly used target skills per number of words written. The data will be interpreted to determine whether the computer component increased the volume of correctly used target skills.

V. SPECIFIC RISKS AND PROTECTION MEASURES

The names of the participants and their school district will be kept confidential and be known only to the researchers and their teacher. Consent

and assent forms, as well as copies of the writing samples, will be secured in Dr. Christopher Skinner's office (518 Claxton Addition). The participant's identity will remain confidential if the results are shared in a professional presentation or publication. Finally, the participants will be notified of their option to terminate their participation at any time. No other risks are foreseen and the research will be halted immediately if any occur.

VI. BENEFITS

We may learn additional benefits of computers and word processing on writing output, in particular when looking at the development of certain target skills. Overall, the risks are minimal.

VII. METHODS FOR OBTAINING "INFORMED CONSENT" FROM PARTICIPANTS

The consent form will be given to the students to take home to their parents/guardians. Only those students who return a signed consent form will be given the assent form. The assent form will be read to the students to ensure understanding of the process. As stated in Section V, the consent and assent forms will be secured in Dr. Christopher Skinner's office (518 Claxton Addition).

VIII. QUALIFICATIONS OF THE INVESTIGATOR(S) TO CONDUCT RESEARCH

Eden Abramson and Christine Neddenriep are in their second year in the Educational Psychology Doctoral Program with primary concentration in

School Psychology at the University of Tennessee – Knoxville. They both have their Masters in School Psychology and Psychology respectively.

IX. FACILITIES AND EQUIPMENT TO BE USED IN THE RESEARCH

The paper, pencils, and computers will be provided by the Campbell County School District. The researcher will provide a timer and the story starters.

X. RESPONSIBILITY OF THE PRINCIPAL/CO-PRINCIPAL INVESTIGATOR(S)

By compliance with the policies established by the Institutional Review Board of the University of Tennessee, Knoxville, the principal investigator(s) subscribe to the principles stated in “The Belmont Report” and the standards of professional ethics in all research, development, and related activities involving human participants under the auspices of the University of Tennessee, Knoxville. The principal investigator(s) further agree that:

- a. Approval will be obtained from the Institutional Review Board prior to instituting any change in this research project.
- b. Development of any unexpected risks will be immediately reported to the Compliances Section.
- c. An annual review and progress report (Form R) will be completed and submitted when requested by the Institutional Review Board.

- d. Signed informed consent documents will be kept for the duration of the project and for at least three years thereafter at a location approved by the Institutional Review Board.

XI. SIGNATURES

Principal Investigator: Eden Abramson

Signature _____ Date _____

Co-Principal Investigator: Christine Neddenriep

Signature _____ Date _____

Faculty Advisor: Dr. Christopher Skinner

Signature _____ Date _____

XII. DEPARTMENT REVIEW AND APPROVAL

The IRB departmental review committee has reviewed and approved the application described above. The DRC recommends that this application be reviewed as:

☒ Expedited Review – Category: 7

OR

☐ Full IRB Review

Chair, DRC: Dr. Robert Williams

Signature _____ Date _____

Department Head: Dr. R. Steve McCallum

Signature _____ Date _____

Protocol sent to Compliance Section for final approval on March 28, 2001

Approved: Compliance Section
Office of Research
404 Andy Holt Tower

Signature

Date

Appendix B

Operational Definition for Adjectives

- Adjectives are descriptive words that modify nouns or pronouns. An adjective identifies how many, which one, or what kind associated with the noun or pronoun. For example:

How many: There are **several** students with jobs.

The child blew out **six** candles on her cake.

The baseball player hit **numerous** home runs.

Which one: **Those** apples were eaten.

We are not going on vacation **this** season.

The boy realized he did not like **that** game.

What kind: I saw a **beautiful, red** car.

The sky is **gray** today.

Her **long** hair was in a ponytail.

- Another form of adjective, known as a predicate adjective, describes the subject of the sentence. For example:

I was **sleepy**.

Sleepy describes the subject "I."

She became **enraged**.

Enraged describes the subject "She."

- Adjectives can also be two words connected with a hyphen, such as "part-time employee."

- Articles, both indefinite (such as *a* and *an*) or definite (such as *the* and *this*) act as adjectives. They can come before a noun or another adjective. For example:

The ball hit **a** new car.

This child is **an** old student.

Appendix C

Guidelines for Scoring Adjectives

- When scoring the writing samples for adjectives, identify accurate use by circling the adjective(s) with a red pen. The word being modified should be underlined with a red pen.
- Score every identified adjective, even if it is spelled incorrectly. If the word is recognizable as an adjective, include it in the tally.
- There may be incomplete sentences within the writing samples. However, if an adjective and the word it modifies are present, the adjective should be scored.
- A hyphenated adjective, or adjectives that should be hyphenated, are scored as one adjective. For example:

The **part-time** employee wanted a vacation.

Part-time is considered one adjective.

- Proper nouns should not be included in the adjective tally. For example:

The **White** House is in Washington, D.C.

Although *White* is an adjective, it is part of a proper noun and therefore, should not be included in the tally.

Appendix D

Operational Definition for Adverbs

- Adverbs are descriptive words that modify a verb, an adjective, or another adverb. For example:

—an adverb modifying a verb:

The plane flew **swiftly**.

The verb in this sentence is *flew* and *swiftly* is describing how for that action.

—an adverb modifying an adjective:

The **boldly**-spoken man shared his view at the meeting.

Spoken is an adjective describing the man. *Boldly*, in turn, is describing how he spoke, which modifies the adjective.

—an adverb modifying an adverb:

The car drove **more** quickly.

The verb in this sentence is *drove* and is modified by the adverb *quickly*. *More* further modifies *quickly* by adding more descriptive action.

- Adverbs can describe how, when, and where an action occurs. For example:

How: The boy ran **quickly**.

The girl cried **softly**.

The car moved **swiftly**.

When: **Yesterday**, we watched a movie.

The game was canceled **today**.

She called the electric company **immediately**.

Where: The baseball players are meeting **here**.

We arrived **there** on time.

- Adverbs do not always appear next to the word they modify. For example:

Unfortunately, the post office closed.

Unfortunately is an adverb modifying when the post office closed.

Today, we are going to the beach.

Today is an adverb modifying when we are going to the beach.

- Frequently, adverbs end in the suffix *ly*. However, there are adverbs—such as *fast* and *late*—that do not follow this rule. There are also words that end in *ly*—such as *friendly*, *kindly*, and *lonely*—that aren't adverbs.

- The following words are often overlooked as adverbs. However, they are considered adverbs and should be scored when found.

Consequently	Indeed	Nonetheless
Finally	Instead	Otherwise
Furthermore	Likewise	Still
Hence	Meanwhile	Then
However	Nevertheless	Therefore
Incidentally	Next	Thus

- To check whether you have chosen an adverb correctly, change the sentence into a question with the adverb under consideration as the answer. Here are some examples using the sentences from the second bullet in this list:

The boy ran **quickly**.

How did the boy run?

The answer is *quickly* which verifies that the adverb is correct.

Yesterday, we watched a movie.

When did we watch a movie?

The answer is *yesterday* – an adverb.

The baseball players are meeting **here**.

Where are the baseball players meeting?

The answer is *here* – an adverb.

Appendix E

Guidelines for Scoring Adverbs

- When scoring the writing samples for adverbs, identify accurate use by circling the adverb(s) with a green pen. The word being modified should be underlined with a green pen.
- Score every identified adverb, even if it is spelled incorrectly. If the word is recognizable as an adverb, include it in the tally.
- There may be incomplete sentences within the writing samples.
However, if an adverb and the word it modifies are present, the adverb should be scored.

Appendix F

Guidelines and Scoring Criteria for Calculating Overall Word Count

- Count the number of words that are correctly written – correct words are those which are recognizable (even if misspelled).
- Capitalization and punctuation are ignored.
- Numbers and proper nouns are included.
- For the word processing samples, spaces between words may not be evident. However, if the words are distinguishable, they can be counted separately. If the word(s) are undistinguishable, do not include them in the count.
- Some students may write "The End" after their writing sample. Do not count these words in the overall word count.
- Do not count the students' names or the word "by" in the word count.

Appendix G

*Story Starters**Pre-test Week #1*

Sample #1 – I'm a shoe. I've walked a lot of miles and seen many things. Once...

Sample #2 – I never expected that one day I'd open my closet and find...

Sample #3 – Late one night the neighbor knocked on the front door and asked...

Daily Writing Day #1 Week #1

My friend and I were walking by an old deserted house and...

Daily Writing Day #2 Week #1

I was fishing in the river when I felt a terrific tug on the line and...

Daily Writing Day #3 Week #1

One very dark, spooky night I was camping in the woods. I heard a strange...

Daily Writing Day #4 Week #1

It was a hot, dry day and I had been walking for hours without food or water when...

Pre-test/Post-test Week #2

Sample #1 – I'm a quarter. I can tell you some good stories about where I've been.

Sample #2 – Goats, sheep, and chickens belong on a farm, not in the middle of...

Sample #3 – I don't believe in magic pencils, but...

Daily Writing Day #1 Week #2

She was a funny old lady, but I knew she had come to tell me...

Daily Writing Day #2 Week #2

A strange thing happened to me last month. There was a loud pounding on my door.

Daily Writing Day #3 Week #2

Something brushed up against my foot and my surprise turned to horror as I looked down and saw...

Daily Writing Day #4 Week #2

My grandpa is one cool dude. Last night he showed up at our door wearing a gold hoop earring and...

Post-test Week #3

Sample #1 – The airplane sputtered and sank low in the jungle. Then...

Sample #2 – A piercing scream broke the stillness. I saw...

Sample #3 – I found a note under my pillow that said...

Appendix H

Procedural Integrity Checklists

Pre-test/Post-test Week # ____ Day/Date _____

Action	Completed
1. Provide 1 st story starter to students.	_____
2. Read story starter to class.	_____
3. Tell the students they will be asked to write a story using the starter as the first sentence.	_____
4. The students have 1 minute to think about a story before they begin writing.	_____
5. Set the timer for 1 minute.	_____
6. After 1 minute, tell the students to begin writing.	_____
7. Time for 3 minutes.	_____
8. If the students stop writing before time is up, encourage them to keep writing until time expires.	_____
9. Call "Stop" when time expires.	_____
10. Have students put their name on the writing sample.	_____
11. Collect handwritten writing samples and place in folder.	_____
12. Provide 2 nd story starter to students.	_____
13. Read story starter to class.	_____
14. Tell the students they will be asked to write a story using the starter as the first sentence.	_____

15. The students have 1 minute to think about a story before they begin writing.

16. Set the timer for 1 minute.

17. After 1 minute, tell the students to begin writing.

18. Time for 3 minutes.

19. If the students stop writing before time is up, encourage them to keep writing until time expires.

20. Call "Stop" when time expires.

21. Have students put their name on the writing sample.

22. Collect handwritten writing samples and place in folder.

23. Provide 3rd story starter to students.

24. Read story starter to class.

25. Tell the students they will be asked to write a story using the starter as the first sentence.

26. The students have 1 minute to think about a story before they begin writing.

27. Set the timer for 1 minute.

28. After 1 minute, tell the students to begin writing.

29. Time for 3 minutes.

30. If the students stop writing before time is up, encourage them to keep writing until time expires.

31. Call "Stop" when time expires.

32. Have students put their name on the writing sample. _____

33. Collect handwritten writing samples and place in folder. _____

Daily Writing Week # _____ Day/Date _____

Action	Completed
1. Brief lesson on target skill # _____	_____
A. Review target skill rule and usage.	_____
B. Praise student's for incorporating target skill into their writing.	_____
C. Present three examples of appropriate usage of the target skill (taken from students' writing samples from previous day's writing).	_____
D. Present an example where the target skill was used incorrectly (preferably from a student writing sample from the previous day) and discuss how to correct the usage.	_____
E. Use a sentence from a student's writing sample and discuss how to increase or modify the usage of the particular target skill.	_____
F. Finally, clarify the target skill rule and usage again.	_____
G. Ask if the class has any questions.	_____
H. Move to step #2.	_____
2. Move computer Group to work stations in classroom.	_____
3. Provide story starter to students.	_____
4. Read story starter to class.	_____

5. Tell the students they will be asked to write a story using the starter as the first sentence. _____
6. The students have 1 minute to think about a story before writing. _____
7. Set the timer for 1 minute. _____
8. After 1 minute, tell the students to begin writing. _____
9. Start the timer and time for 9 minutes. _____
10. If the students stop writing before time is up, encourage them to keep writing until time expires. _____
11. Call "Stop" when time expires. _____
12. Have students put their name on the writing sample. _____
13. Collect handwritten writing samples and place in folder. _____
14. Save word processing writing samples on a disk. _____

VITA

Eden Michelle Abramson was born in Boston, Massachusetts on February 3, 1972. She graduated from Acton-Boxborough Regional High School in 1990. Her education continued at the University of Massachusetts – Amherst where she received a BA in Psychology in 1994, and then at Tufts University where she received both a Masters in School Psychology (1996) and a Certificate of Advanced Graduate Study (1997). She worked as a school psychologist in Massachusetts before returning to school to earn her Doctor of Philosophy degree with a major in Education at the University of Tennessee – Knoxville in 2002.

Eden is currently working as a school psychologist in Anchorage, Alaska.