The Effects of Repeated Writing on Secondary Students’ Writing Fluency

Dissertation

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By

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Abstract

A multiple baseline across subjects design was used to evaluate the effectiveness of repeated writing, self-graphing of total words written (TWW), and feedback on the writing fluency of high school students with disabilities. In one experimental group, the individual components of self-graphing, repeated writing, and feedback were introduced cumulatively. In the second experimental group, participants moved directly from baseline condition to repeated writing with self-graphing and feedback. Results were mixed within and across groups. High variability was observed across participants and phases. Self-graphing of TWW was associated with an improvement in quantity and quality in two of three participants in Group One. Repeated writing was associated with an improvement in quantity with a decline in quality in all participants in Group One. Feedback was associated with a decline in quantity and an improvement in quality in two participants in Group One; a third participant showed the same effect but only one writing was conducted with feedback. A decline in quantity and an improvement in quality were also observed in one of four participants in Group Two. Indicators of social validity for the intervention were positive from participants and responding teachers and parents. Qualitative independent evaluations of overall writing quality failed to demonstrate improvement between pre and post-intervention responses as well as between first and second writings with self-graphing and feedback.
Dedication

Dedicated to my husband, Dr. Martin Taylor, for years of support and encouragement and in loving memory of my grandmother, Ellie Elizabeth Campbell, for teaching me the value of education.
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Fields of Study

Major Field: Education

Minor Field: Research Methods in Human Resource Development
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Chapter One: Introduction

No two writers are the same. Writing is both an art and a science. Whereas the technical correctness of a sentence can be quantified, assessing the quality of hundreds of words, each of individual denotation, grafted together into an essay of unique connotation and voice remains an elusive task. Just as Justice Potter Stewart’s statement, “I know it when I see it.” (Jacobellis v. Ohio, 1964) failed to provide an objectively measurable standard for obscenity in film, it did capture the difficult, seemingly impossible task of reducing a creative work down to a single adjective: obscene or tasteful, bad or good.

Few students will ever produce a major motion picture. Few students will ever compose a master symphony or choreograph a ballet, but almost all will be expected to create written works that at an absolute minimum communicate ideas through the conventional use of language but that also convey something that transcends the words on the page. Those who use language well can define moments and inspire movements, manipulating the science to create the art. With few exceptions, those who fail to master the science of writing never have the skills to create art. Far more than just failing to participate in a collective culture of writing, these individuals never develop the power to use words to engage higher education, improve their employment options, or seek justice when they have been wronged. They become marginalized in a highly verbal, increasingly text-defined world (National Commission on Writing for America’s Families, Schools, and Colleges, 2004, 2005).
Literary scholars can spend decades debating the virtues of some texts, but it does not take a literary scholar to immediately and almost instinctively condemn poor writing. Although the exact parameters of “poor writing” are difficult to define, readers of such experience an intuitive, often visceral reaction and, to paraphrase Justice Steward: They know bad when they read it. Writing generally creates a permanent product that often is judged by readers in the absence of the writer. Whether email messages, college application essays, resumes, or memos, high school graduates of 2010 and beyond will need to be able to produce fluent and accurate text in multiple contexts in their personal and professional lives.

**National and State Student Writing Achievement**

The writing of typical students develops over time in predictable ways beginning with squiggles that tell an entire story and phonetically spelled words that only the child and early childhood teacher can decipher to fragments and eventually complete thoughts (Clay, 1975). By middle school, students are expected to write complete sentences, consistently adhere to basic conventions of written language such as indentation at the beginning of a paragraph, use of a capital letter at the beginning of a sentence and ending with a punctuation mark. By high school, students are expected to write essays in response to test questions, write research papers in a variety of courses, and increasingly demonstrate command of complex sentence structure and mechanics. They are expected to produce both quantity and quality as they adapt their writing for a variety of audiences (National Council of Teachers of English, 2010). This is no easy task as summarized by Troia (2006): “composing text is most certainly a complex and difficult undertaking that
requires the deployment and coordination of multiple affective, cognitive, linguistic, and physical operations to accomplish goals associated with genre-specific conventions, audience needs, and communicative purposes” (p. 324).

Many students enter high school years behind their peers in writing development and struggle to meet the writing demands of the high school curriculum and high school exit exams. The 2007 National Assessment of Educational Progress (NAEP) showed gains in writing proficiency among 8th and 12th grade students in the United States when compared with 2002 results from the same populations. The NAEP is a test of 4th, 8th and 12th grade student achievement; however, 4th grade students were not assessed in writing in 2007. On a 300-point scale, the average score of 8th and 12th grade students increased by 3 and 5 points, respectively. Eighty-eight percent of 8th grade and eighty-two percent of 12th grade students scored at or above the Basic level defined as “partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at a given grade” (National Center for Education Statistics, 2008c, p. 6). Similar gains were also seen in 8th and 12th grade students between 1998 and 2002. Although the average national performance of high school students has shown a positive trend, a large number of 12th grade students (18%) failed to demonstrate fundamental writing skills. The NAEP writing tests will be administered again in 2011 (National Center for Education Statistics, 2010a).

In addition to a national assessment of writing that occurs approximately every five years, state departments of education assess writing competencies at various grade levels yearly with results reported in state, district and building report cards. In 2009, writing achievement was assessed in the state of Ohio by the Ohio Achievement Test...
(OAT), administered to 4th and 7th grade students, and the Ohio Graduation Test (OGT), administered to 10th grade students. From least to most proficient, scores are grouped into five categories: Limited, Basic, Proficient, Accelerated, and Advanced. Scores that fall in the Proficient, Accelerated, and Advanced Ranges are passing scores. Statewide, 84.5%, 80.5%, and 89.7% of 4th, 7th, and 10th grade students, respectively, earned scores at or above the Proficiency Level. Approximately 10% of 10th grade students in Ohio will continue to take the Writing Ohio Graduation Test (Writing OGT) until they achieve a passing score. In addition to completing a high school curriculum, students must pass all sections (Reading, Mathematics, Writing, Science, and Social Studies) to obtain a regular high school diploma (National Center for Educational Statistics, 2010b; Ohio Department of Education, 2010).

The Writing Ohio Graduation Test (Writing OGT) includes essays as well as questions that require multiple-choice or short answer responses. The Writing OGT administered in Spring 2008 required students to write essays in response to two prompts, one persuasive and one expository. The two essays represented ¾ of possible points on the exam. Students were given 150 minutes to complete the exam. The expository prompt to which students were asked to respond was as follows:

People often make a positive difference in others’ lives. Think of a person who affected your life or the life of someone you know. Provide specific details about the person, what the person did, and how this person made a positive difference in someone’s life. Write your response in the answer document (Ohio Department of Education, 2008c, p. 11).
On this and other OGT prompts, the majority of students were able to produce responses of sufficient length and quality to earn a passing score. For a significant minority of students in the cooperating district, even this relatively simple, straightforward prompt did not result in a passing response (Ohio Department of Education, 2008a). Students had not been asked to explain the impact of US foreign policy on a developing nation. They were asked to compose and transcribe an essay on a topic of personal relevance and were unable to do so.

**Writing Achievement Among Students with Disabilities**

Unfortunately, students unable to produce a passing response were disproportionately students with disabilities. In 2006-2007, 56.4% of 10th grade students with disabilities in Ohio passed the Writing OGT in contrast to 94.6% of students without disabilities. The achievement gap in writing is consistent with an achievement gap evident across tested academic domains (Ohio Department of Education, 2008b). Nationally, cumulative deficits are evident in the achievement gap between students with and without disabilities as measured by the rates of graduation with a regular diploma. In 2005-2006 the nationally averaged freshman graduation rate for public schools was 75% in contrast to 57% of students with disabilities (National Center for Educational Statistics, 2008a; National Center for Education Statistics, 2008b).

Nationally, in 2007, students identified as having Specific Learning Disabilities (SLD) made up the largest group of students with disabilities with numbers often two to three times greater than students identified as having Speech or Language Impairments (SLI), the second most prevalent category. In Ohio, these two populations represented 56% of all students receiving special education services (Data Accountability Center,
Reported disability categories should be interpreted broadly because research has shown that difficulty with literacy in students with early language impairment is often later labeled a Specific Learning Disability and that the determination of SLD or SLI as a primary diagnosis may be a function of circumstances and evaluators and represent dimensional and not categorical differences (Nelson, Roth, & Van Meter, 2009).

Classroom difficulty with reading and writing tasks account for the greatest number of referrals for evaluation and placement in special education (Baker, Gersten, & Graham, 2003; Kavale & Forness, 2000). Whereas the majority of students in most states who qualify for special education services are identified with either SLD or SLI, secondary involvement of language and literacy systems occurs with almost all other developmental disorders and with the acquired disorders of childhood and adolescence. Language development, and particularly written composition, requires the integration of a number of cognitive-linguistic, sensory-motor, and social-emotional systems. As such, it is vulnerable to primary diagnosis involving any of those developmental systems. Students may need deliberate attention to their language and literacy learning needs, whether they are diagnosed with autism spectrum disorder, intellectual disability, hearing impairment, visual impairment, attention-deficit disorder, emotional impairment, behavioral disorder, or complex communicative needs associated with severe impairment of multiple systems. (Nelson, Roth, & Van Meter, 2009, p. 190)

Therefore, writing interventions should be developed for students with demonstrated difficulties in writing based on the nature of the writing deficit and not the identified area of disability.
Unfortunately, the empirically validated instructional methods needed to bridge the achievement gap between students with and without disabilities are lacking across domains (Allbritten, Mainzer, & Ziegler, 2004) but are especially evident in a lack of studies related to the remediation of writing in high school students (Graham & Perin, 2007a).

**Writing Intervention at the Secondary Level**

In a survey conducted by the National Commission on Writing and the National Governors Association completed by state human resources directors, nearly 100% of respondents ranked accuracy, mechanics (spelling, grammar, and punctuation), clarity, documentation and support, sound logic, and conciseness as either important or extremely important qualities of good writing (National Commission on Writing for America’s Families, Schools, and Colleges, 2005). For any of those attributes of quality writing to be measured, there must first be a written product of sufficient length and complexity to evaluate.

In the past few decades several cognitive models of the writing process have been proposed and studied (Nystrand, 2006). Hayes and Flower (1980) organized the writing process into three components: planning, translating, and reviewing. Chenoweth and Hayes (2001) expanded the model for written language production to three levels: Resource Level including working memory, long term memory, and process of reading; Process Level including external task demands, resources and the text in process as well as internal components including planning, translating, revising, and transcribing; and Control Level including the task schema. Skill, the flexible combination of automaticity and awareness (Tonnessen, 1999) or fluency, high rates of accurate responding (Dermer,
Lopez, & Messling, 2009) could potentially interact recursively at every proposed level of cognitive processing and with every component of the written product. Indeed, fluency has been studied in multiple cognitive dimensions. In a meta-analysis of fluency as a construct, Alter and Oppenheimer (2009) stated, “Because every cognition falls along a continuum from effortless to demanding and generates a corresponding fluency expectation, the authors argue that fluency is a ubiquitous metacognitive cue in reasoning and social judgment” (p. 219).

In an applied setting such as a high school, one could argue that fluency, as it subsumes skill, is the end goal of education across subject areas. Studies have suggested, that procedures that promote fluency can promote important learning outcomes, such as retention (i.e., appropriate, high-rate behavior persists long after training is completed), endurance (i.e., appropriate, high-rate behavior persists for durations greater than the durations of practice sessions), application (i.e., behavior can easily combine with other behaviors to form composites), and adduction (i.e., behaviors combine to form new behavior with little or no additional instruction). (Dermer, Lopez, and Messling III, 2009, pp 4-5)

Although there are relatively few studies of academic interventions designed to improve writing fluency, several studies have shown that fluency training improves quality and/or quantity of written products (Dermer, Lopez, & Messling III, 2009; Li, 2007; Kasper-Ferguson & Moxley, 2002).

Students must be able to write fluently in order to produce adequate responses for academic tasks and standardized tests while in school and for a variety of purposes and audiences across their lifespan. For this study, writing fluency is defined as “the amount
of text written and the skill or ease with which it is generated” (Robinson & Howell, 2008, p. 444). Some high school students, especially students with disabilities, need to increase their writing fluency in order to take notes quickly during lectures, complete research projects or presentations that involve a written product, and compose essays under time constraints that demonstrate comprehension of lessons.

Providing writing remediation can be challenging for secondary educators who teach many students who are no longer working on fundamental writing skills and for secondary educators with little experience teaching foundational writing skills. (Englert, Okolo, & Mariage, 2009). Moreover, reading and writing research has disproportionately focused on elementary aged students, and although current national and state educational mandate require empirically validated educational interventions for all students, few published studies have tested writing interventions with high school students (Biancarosa & Snow, 2006; Graham & Perin, 2007b). As such, high schools that seek to provide focused interventions for specific writing deficits have very few empirically validated writing interventions on which to base remediation for older students.

Repeated Writing to Increase Writing Fluency

Writing fluency is one area of secondary writing remediation that warrants experimental study and that bears some similarity to the remediation of reading fluency. Within the area of reading skills, researchers have found that reading fluency has been shown to be a good predictor of reading comprehension (Fuchs, Fuchs, Hosp, & Jenkins, 2001). One way to increase reading fluency is to have students engage in repeated readings of text (National Reading Panel, 2000). Repeated Reading is an established academic intervention for increasing reading fluency in which students reread a passage
aloud until mastery (Chard, Vaughn, & Tyler, 2002; Samuels, 1997; Therrien & Kubina, 2006). Repeated Reading has been effective in increasing reading fluency in students who have already acquired foundational reading skills and are developing proficiency with their use (Fuchs, Fuchs, Hosp & Jenkins, 2001; Mercer & Mercer, 2001; National Reading Panel, 2000).

Studies of Repeated Reading with secondary students have shown increased reading fluency without significant improvement in comprehension (Valleley & Shriver, 2003), increased reading fluency with improvement in comprehension (Alber-Morgan, Ramp, Anderson, & Martin, 2007), and improvement of oral reading fluency with functional and grade level text (Strong, Wehby, Falk, & Lane, 2004).

The first published study of repeated writing used a pretest posttest design to measure change in fluency and mechanics in the expressive writing of adolescents with learning disabilities. After implementing a repeated writing procedure for five days, Harriman and Gajar (1986) found a statistically significant improvement in fluency and mechanics. Bauernschmidt (1991) conducted a similar repeated writing intervention using an ABAB design with three 5th and 6th grade students with learning disabilities and emotional disorders. During the intervention phase, students wrote to the same story starter every day for five days. The repeated writing condition showed improvements in writing fluency not seen in baseline condition in which students wrote to a different story starter each day.

Although evidence supporting repeated writing to increase fluency at the high school level is based on only a few studies, the few existing studies of repeated writing support extrapolation of the intervention from reading fluency to writing fluency.
Repeated Reading and repeated writing are procedurally similar and the extension from one domain to the other is based on the assumption that automaticity in writing text may develop in similar form with automaticity in decoding text and that both increase with practice. In addition to duplicating the component of repetition seen across studies of repeated writing, this study also incorporated self-graphing and feedback, components that independently have been shown to improve writing fluency (Rosenthal, 2006; Stotz, Itoi, Konrad, & Alber-Morgan, 2008). It is possible that increased writing fluency enables better learning outcomes, allows students to use writing as a tool for learning, and results in the composition of lengthier passages as required at the high school level and beyond (Graham & Perin, 2007a).

The intervention of repeated writing, defined as writing more than once to the same prompt during the same session, as well as study elements designed to enhance phase contrast (self-graphing and feedback) are consistent with effective established writing instruction for secondary students that incorporate goal setting for productivity, strategy instruction, sentence construction, and self-monitoring (Rogers & Graham, 2008).

**Measurement of Writing Quantity and Quality**

There are multiple writing processes (e.g., planning, translating) and multiple components of written expression (e.g., word choice, punctuation) that may be influenced by a writing intervention. This, in combination with interactions between process, product and individual differences, makes measurement and accurate causal attribution problematic, at best. Previously cited standardized measures of writing achievement, the NAEP and Writing OGT, measured attributes of writing including knowledge and use of
written language and conventions of writing that compared from one point in time the performance of all students tested. While providing global statistics and trends and illuminating discrepancies across populations and regions, such standardized tests do not assess writing fluency, are of limited use assessing gradual change, and may be of limited content validity (Shin, 1989). They are, therefore, of limited use in either the day-to-day formative assessments needed to inform classroom instruction or in the quantitative assessment of change during an individually administered writing intervention.

Curriculum-based measurement (CBM) is an empirically validated direct evaluation of individual progress that allows for an assessment of fluency. It is sensitive to incremental change and has established validity in written products in many grades and populations. Curriculum-based measures have demonstrated validity in both quantitative and qualitative aspects of written products (Espin, Wallace, Campbell, Lembke, Long, & Ticha, 2008; Gansel, Noell, VanDerHeydan, Naquin, & Slider, 2002; Malecki & Jewel, 2003; Shin, 2008).

Total Words Written (TWW) is an indicator of writing production in which the number of words, defined as any group of letters separated by a space, are counted without regard to spelling, punctuation, or usage (Shinn, 1989). For example, the sentence “grag and kye never went with I.” includes seven words even though “grag” is not capitalized, “grag” and “kye” are misspelled, and “I” is an incorrect usage of the pronoun. Given that TWW is easily collected and communicated, and the decision to move between phases must be made relatively quickly, TWW is a practical primary dependent variable (Espin, De La Paz, Scierka, & Roelofs, 2005; Malecki & Jewell, 2003).
In order to capture change in older students’ writing, it is necessary to measure change in quantity relative to change in quality (Jewell & Malecki, 2005). Correct Minus Incorrect Writing Sequences (CIWS) is an indicator of writing accuracy and production in which the number of Correct Writing Sequences (CWS) is reduced by the number of Incorrect Writing Sequences (IWS). Writing sequences are two adjacent writing units including elements of spelling, punctuation, and usage. For example, the sentence “We are going out to see a movie.” includes 7 correct sequences and 2 incorrect sequences for a total CIWS of 5. Correct minus incorrect writing sequences has shown superior technical adequacy when compared with TWW for predicting performance on state standards tests in 10th grade students (Espin et al., 2008).

Words Spelled Correctly (WSC) is an indicator of writing accuracy and production in which the number of correctly spelled words is counted and recorded. A group of letters is counted as correctly spelled if it is recognizable as English even if incorrect in the current context. For example, the sentence "Me will gert ice kreme win I home from schol" includes seven correctly spelled words. The word "me" is counted as correct because it is spelled correctly and is recognizable English even though it is the incorrect case of the pronoun, and the word "win" is counted as correct for the same reasons even though it is a homonym for the intended word. Words Spelled Correctly has been shown to be a valid indicator of writing fluency that is sensitive to growth at all grade levels across the academic year (Maleki & Jewell, 2003).

Number of Correct Punctuation Marks (CPM) is an indicator of writing accuracy and production in which punctuation marks are identified and counted as correct if they are in the correct location for the sentence and appropriate for the sentence in that
location. For example, the sentence, "Tyler, Susan, and Ray want to ride the horses?" includes two correct punctuation marks. The two commas in a series are both correct for the sentence and correct for the location. The question mark would not be counted as correct because, while being correctly placed, it is inappropriate for the sentence.

Although the number of CPM may vary from student to student due to stylistic differences, within an individual, it may be a reliable indicator of competence in writing. Less mature writers tend to use simple sentences that generally require one punctuation mark at the end of the sentence; however, more advanced writers use compound and complex phrases and sentences that require commas, semicolons and other punctuation marks. As such, CPM may indicate both automaticity/fluency in punctuation as well as change in sentence complexity (Gansle et al., 2002).

Percent Correct Sequences (%CS) is a derivation of CIWS in which the number of correct sequences is divided by the total number of sequences (correct plus incorrect sequences) and then multiplied by 100. Although %CS provides no indication of quantity, a participant could write ten words in five minutes with 100% accuracy or 80 words in five minutes with 85% accuracy, it does, in combination with TWW, allow for a simple reference of quality. Early studies of CBM in writing favored percentage measures over counting measures at the secondary level; however, they were seen as problematic for progress monitoring for reasons described. Although Malecki and Jewell (2003) found that percentage measures did not adequately differentiate between elementary and secondary students or between measures taken early and those taken late.
in a school year, the measure may be useful at the high school level for ipsative analysis of quality when juxtaposed to an indicator of quantity to determine if changes in quantity are occurring at a cost to quality.

Statement of the Problem

High school students with disabilities in Ohio are expected to write expository essays under time constraints in response to questions/writing prompts across academic domains and grades as well as on a standardized exit achievement exam, yet many students are unable to compose essays of sufficient length and/or quality to earn passing grades in academic classes or proficient scores on standardized tests.

Purpose of the Study

The purpose of the study is to empirically evaluate the effects of repeated writing with and without self-graphing or feedback for a sample of high school students with disabilities and who have demonstrated poor writing skills.

Research Questions

The research questions for this study were as follows:

1. Does self-graphing of Total Words Written (TWW) improve writing fluency in secondary students as measured by TWW, Correct Minus Incorrect Writing Sequences (CIWS), number of Words Spelled Correctly (WSC), number of Correct Punctuation Marks (CPM), and Percent of Correct Sequences (%CS)?

2. Does repeated writing with self-graphing improve writing fluency in secondary students as measured by TWW, CIWS, WSC, CPM, and %CS?
3. Does repeated writing with self-graphing and feedback improve writing fluency in secondary students as measured by TWW, CIWS, WSC, CPM, and %CS?

4. Does repeated writing with self-graphing and corrective feedback result in written products scored to be superior to baseline written products?

5. Does repeated writing with self-graphing and corrective feedback result in a second written product scored to be superior to an initial written product.

6. Do participants, parents, and teachers affirm that the intervention was acceptable and useful as measured by individual written survey?

**Significance of the Study**

Although Repeated Reading is an established intervention to increase writing fluency and comprehension, repeated writing in some form has only been studied in a few, small studies. Secondary students are asked to respond to expository writing prompts in multiple academic contexts. Repeated writing to expository writing prompts as an educational intervention represents an extension of teaching practices from the field of reading to writing. This study will contribute to the body of knowledge by experimentally validating or invalidating repeated writing to expository writing prompts as an academic intervention to build writing fluency in older writers. This study represents both the development of a new writing intervention (Repeated Writing, as defined, with self-graphing and feedback) and an application to an understudied population.
**Definition of Terms**

Correct Minus Incorrect Writing Sequences (CIWS): An indicator of writing accuracy and production in which correct and incorrect writing sequences are counted and then the number of incorrect sequences is subtracted from the number of correct sequences.

Correct Punctuation Marks (CPM): An indicator of writing accuracy and production in which the number of correct punctuation marks is counted.

Correct Word: A word that can stand alone in any grammatical context.

Intervention Study Center: A study period during the academic day in which students work on specific skill deficits.

Exit Exam: A standardized exam required for graduation from high school.

Expository Writing: Writing used to inform, explain or describe.

Percent of Correct Sequences (%CS): An indicator of writing quality derived from CWS and IWS in which CWS is divided by CWS+IWS and multiplied by 100.

Reading Fluency: Automaticity in decoding text.

Repeated Reading: An educational practice/intervention in which a student reads and rereads the same passage orally until meeting a criterion.

Repeated Writing: An educational practice/intervention in which students respond to the same writing prompt more than once in one session.

Total Words Written (TWW): An indicator of writing production in which the total number of word-like groups of letters is counted.

Word-like Group of Letters: Any group of letters, recognizable as English or not, separated by a space.
Writing Fluency: "The amount of text written and the skill or ease with which it is generated" (Robinson & Howell, 2008, p. 444)

Writing Ohio Graduation Test (Writing OGT):  The writing test required for graduation with a regular high school diploma from an Ohio high school

Writing Sequence (correct or incorrect):  Two adjacent writing units such as capitalization, spelling and punctuation

Words Spelled Correctly (WSC): An indicator of writing accuracy and production in which the number of words spelled correctly is counted
Chapter Two: Review of Literature

This chapter will begin with a discussion of attributes of written expression in students with disabilities. Effective components of writing instruction for all students as well as validated and promising writing interventions for students with learning disabilities are identified. This is followed by a discussion of studies of feedback and writing and self-graphing and writing. The chapter concludes with a review of literature related to the practice of repeated reading, studies of repeated writing, identification of potential parallels between the two, and a discussion of repeated writing with self-graphing and feedback as an instructional method.

Writing Attributes of Students with Disabilities

Difficulties in written expression are seen across types of disabilities due to the cognitive and meta-cognitive demands of creative expression. A second grader might claim that learning to write is difficult: Letters must look like letters, letters must be put in correct order to create words, and some letters should never cross the solid or dashed blue lines. A middle school student might claim that writing is difficult: It takes too much time, there are so many revisions, sentences have to be “complete,” and there should be something called a thesis. High School students may claim that learning to write is difficult because some teachers are good at spotting plagiarism, they are expected to write on diverse subjects for diverse audiences, and the synthesis of multiple sources to
support a well-articulated argument is mentally exhausting. Writing is so difficult that even highly skilled writers have a name for the total failure of fluent text composition—Writer’s Block.

Writing is even more difficult for students with learning disabilities because: they experience problems with multiple aspects of the composing process, including setting goals for writing, generating and organizing ideas, transforming ideas into acceptable sentences, transcribing these sentences onto paper, revising and editing text, creating fully developed papers, and sustaining the writing process. (Graham, Olinghouse, & Harris, 2009, p. 165)

Studies have shown that compositions written by students with learning disabilities are shorter than those of typical peers. Deno, Marston, and Mirkin (1982) analyzed writing products from 44 3rd to 6th grade students and concluded that students with LD wrote fewer words, used less mature words in their writing, and used fewer correct spellings than regular students. MacArthur and Graham (1987) compared 5th and 6th grade students with learning disabilities (LD) under three conditions for text production: handwriting, word processing, and dictation. The authors found that dictated stories were longer and of higher quality than stories handwritten or typed suggesting that the mechanical and conventional demands of writing interfered with quantity and quality of writing. Typical peers of similar age also composed longer dictated stories; however, the discrepancy between dictation and handwriting was not as great and no differences were found in the quality of dictated versus handwritten stories.
In addition, MacArthur and Graham (1987) found that when students with LD made revisions in handwriting and word processing conditions, the majority of corrections were surface-level changes that did little to improve the meaning of the writing. MacArthur, Graham, and Schwartz (1991) found that 7th and 8th grade students with LD demonstrated a limited understanding of revision. When asked to make revisions to narrative and expository writings, students focused on mechanical errors, made papers appear neater, and substituted words but failed to improve the overall quality of their written product. Typical students were much more likely to make substantive changes to writing and emphasize substance over form (Graham, Harris, MacArthur, & Schwartz, 1991).

For a comprehensive discussion of writing difficulties exhibited by students with LD, see Troia (2006). Troia discusses deficits seen in planning, content generation, revising, text transcription, and metacognition and motivation in students with LD. Improvement in writing fluency has the potential to improve each of these areas including motivation. If writing becomes an easier or more validating experience for students, they may feel more motivated to engage in the task.

Although some older students may have problems with motor control, most will have had years of experience to build fluid handwriting. The content demands of every prompt are different, but the fine motor skills necessary to form letters quickly not seen in younger students may be established in older students. Although the demands of writing vary greatly across grade levels, and the difficulties manifested by students with LD may evolve over time, studies across grades, including studies of college students with LD, have shown consistent deficits in quantity and quality of written products when compared
to same age peers. Whereas elementary age students may write shorter, less polished pieces due in part to poor fluency in mechanical skills and secondary students may write shorter, less polished pieces due to poor fluency in content generation, students with LD across grades and stages of development write shorter, less polished works (Houck & Billingsley, 1989; Li & Hamel, 2003; Newcomer & Barenbaum, 1991). As such, teachers of writing in both regular and special education settings need to know effective instructional and intervention methods to help this population improve their writing skills.

Validated and Promising Writing Interventions for Secondary Students with Disabilities

Scientific studies of writing in students with disabilities were rarely conducted prior to the late 1980s; therefore, teaching techniques for exceptional students were based on the writing behaviors and products of experienced writers (Newcomer, Nodine, & Barenbaum, 1988). Remediation based on the behaviors exhibited by exemplars likely results in students with disabilities receiving more of the type of instruction that had already failed to produce adequate learning outcomes. Although the research base for writing instruction has grown by 600% in the last two decades (Graham & Perin, 2007b), “Currently, neither the experimental nor the single-subject design research in writing is broad or deep enough to construct a scientifically based writing curriculum for adolescents” (Graham & Perin, 2007a, p. 315).

Graham and Perin (2007a) conducted a meta-analysis of writing research and identified eleven effective instructional elements for the teaching of writing with 4th to 12th grade students. The effective elements, writing strategies, summarization,
collaborative writing, specific product goals, word processing, sentence-combining, prewriting, inquiry activities, process writing approach, study of models, and writing for content learning, identified the building blocks of effective writing instruction for children with a full range of abilities and provided a foundation for further analysis of effective instructional practices in writing for students with LD.

Based on the analysis of studies with LD students contained in Graham and Perin (2007b) and meta-analysis of single subject studies of writing interventions (Rogers & Graham, 2008), Graham, Olinghouse, and Harris (2009) identified validated and promising writing practices for students with learning disabilities. Validated writing practices for students with LD were based on studies of at least two true, quasi-experimental, or single-subject designs conducted with students with diagnosed learning disabilities. Promising writing interventions were identified from studies of at least two or more true, quasi-experimental, or single-subject design studies with struggling writers not identified as learning disabled. The authors identified the following validated writing interventions for students with learning disabilities listed in descending order from interventions with the most extensive research base to those with the least:

1. Teach students with LD strategies for planning, revising, and editing their compositions (strong positive impact).

2. Use direct instruction to teach grammar skills to students with LD (moderate positive impact).

3. Have students with LD work cooperatively with other struggling writers to plan, draft, revise, and edit their compositions (strong positive impact).
4. Explicitly teach students with LD strategies for producing written summaries of reading material (strong positive impact).

5. Make the process writing approach more effective for students with LD by explicitly teaching them strategies for carrying out the process of planning, revising and editing (strong positive impact).

6. Set clear and specific goals for what students with LD are to accomplish in their writing (moderate to strong positive impact).

The authors identified the following as promising instructional practices for students with LD:

7. Teach writing and reading together as a means of improving the writing of students with LD (strong positive impact).

8. Use word processing and related software as a primary tool for writing with students with LD (moderate to strong positive impact).

9. Teach text transcription skills (handwriting, spelling, and typing) to students with LD (moderate positive impact).

10. Encourage students with LD to monitor one or more aspects of their writing performances (small positive impact).

11. Reinforce positive aspects of writing for students with LD (small positive impact).

The validated and promising instructional practices identified by Graham, Olinghouse, and Harris (2009) are consistent with the identified skill deficits seen in students with learning disabilities and support the positive effects of explicit, direct intervention for students with learning disabilities across grade levels.
Researchers now have a foundation of basic research on which to base the next step. Specific skills deficits have been identified and specific instructional practices have been validated in students with learning disabilities and struggling writers. If students with disabilities were a homogeneous group, researchers and educators might be able to stop there, but students with disabilities require an Individualized Education Program (IEP) because they have not demonstrated academic achievement under traditional educational conditions. Therefore, the next frontier of writing research must focus on empirically validating deficit-specific interventions and establishing optimal combinations of instructional practices that remediate specific deficits and accelerate growth (Graham & Perin, 2007a).

**Studies of Feedback and Self-graphing and Writing**

Feedback, as a general concept, can involve multiple modalities or sources. As such, there is considerable overlap between feedback from teachers, student-generated feedback prompted during instruction, and feedback from self-monitoring. Studies of writing and students with and without LD have shown that systematic instruction and explicit feedback including the student-generated feedback of self-graphing improve the quality and quantity of student writing (Harriman & Gajar, 1986; Kasper-Ferguson, & Moxley, 2002, Martin & Manno, 1995; Shimabukuro, Prater, Jenkins, & Edelen-Smith, 1999; Stotz, Itoi, Konrad & Aber-Morgan, 2007). At the elementary level, students are most often provided feedback on written products in the context of student conferences with teachers and peer-assisted activities such as peer editing (Graham, Harris, MacArthur, & Fink-Chorzempa, 2003).
In an elementary classroom, student-to-teacher ratio, general length and complexity of writing, and class routines are conducive to individual student-teacher conferences to discuss writing. The discrepancy between the most knowledgeable writer in the class and the least knowledgeable writer in the class is not so great as to preclude benefit for both students involved in peer tutoring. This may not be the case in high school where the pace, complexity of assignments, and number of students make student-teacher conferences less likely. The benefit of peer feedback is likely to be a function of the skill of both participants. It is reasonable to assume that poor writers who give poor feedback may find themselves marginalized when it is time to pair up and good writers may have no idea what type of feedback to provide when editing poor writing. Whereas younger students typically receive at least some individualized teacher feedback, it is likely that by high school, feedback most often comes in the form of check marks on a scoring rubric and a final grade, or global feedback and a summative grade.

Perhaps the most compelling evidence of the benefits of feedback comes from the empirical work of Graham and colleagues and the development and validation of Self-regulated Strategy Development (SRSD) in writing (Graham & Perin, 2007b; Rogers & Graham, 2008). SRSD is an approach based on scaffolding of instruction, feedback, and practice until students demonstrate independent mastery of a specific skill. In studies of writing, students are taught a strategy, the instructor provides guidance and feedback, often in the form of graphing performance, and support is faded after the student has reached a criterion level of performance from using the strategy. SRSD is a package intervention that includes multiple components of effective instruction, including feedback that has demonstrated robust positive benefits in writing across grades (Chalk,
SRSD, an instructional method that includes frequent and specific teacher feedback during guided practice, has emerged as best practices in the teaching of composition in students with disabilities (De La Paz, 2007).

The frequency of feedback was studied in isolation by Rosenthal (2006) in a dissertation study of 42 third grade regular education students. Students were randomly assigned to one of three groups: control, writing feedback once a week, and writing feedback three times a week. During baseline condition all students were provided a story starter, asked to think for one minute and then write for three minutes. During intervention, students in the control group continued to write under similar conditions and were thanked for their participation. Data on Total Words Written and Words Spelled Correctly were collected on all students each session but data were never shared with the control group. The second group wrote three times a week but only received feedback on their writing once a week in the form of written information on TWW, WSC, and the number of sentences paired with an up or down arrow to indicate change from previous score. The third group received this written feedback each time they wrote three times a week.

The author found that students who received feedback three times a week showed significantly more growth in TWW. The control group and single weekly feedback groups showed no significant differences in TWW. The group receiving feedback three times a week also demonstrated improvement in WSC which was twice the improvement seen in the control group. In this study students did not generate their own data, but in feedback conditions students had data provided to them either once or three times a week.
Students receiving feedback once a week did not differ from students receiving no feedback, a finding that supports the use of frequent feedback on writing quantity and quality (Rosenthal, 2006).

Van Houten, Morrison, Jarvis, and MacDonald (1975) found that the effects of reinforcement were enhanced with the immediate feedback of self-scoring. During baseline, 55 second and fifth grade students were asked to write as much as they could for ten minutes. Students calculated their scores and then posted them in the front of the classroom. During intervention phase, students were asked to beat their personal best score of number of words written during the same time period. On average, students doubled the number of words written in the presence of a visual metric to beat. Students were able to produce longer written works in the same time period when they were provided with feedback.

Writing production, as measured by T-units, in older students was studied by Van Houten and MacLellan (1981). A T-unit is a dominant clause and all associated dependent clauses. Fifty-four eleventh grade students were studied under three conditions, feedback including self-scoring and posting, instruction in sentence combining, and feedback with sentence combining. Instruction in sentence combining alone failed to demonstrate a statistically significant improvement in T-units. Although feedback and self-recording showed significant gains in writing production, sentence-combining instruction with self-scoring and public posting of scores demonstrated the greatest gains in writing production as measured by t-units. When high school students were provided with explicit instruction in a method to improve sentence quality, were given feedback about their performance, and were provided with an external source of
motivation (posting of scores), they wrote significantly more words. Both studies were conducted with regular education students and supported both the use of specific feedback on a measure of writing fluency and the benefit of having that feedback readily available to students.

Feedback in the form of teacher prompting has also shown positive effects for increasing production in student writing. In a study of three junior high students with emotional disturbance, Schloss, Harriman and Pfeifer (1985) found that increasingly specific teacher prompts delivered every 20 seconds increased the quality and quantity of written work even after teacher feedback was faded. Harriman (1985 as cited in Harriman & Gajar, 1986) did not find a significant difference between systematic and random prompting in secondary students with LD; however, the most effective condition utilized systematic prompting with self-monitoring of prompts and production. With systematic prompting, increasingly specific and directive prompts were given when students did not write a sentence within a specified time period, and with random prompting, students were provided a prompt of randomly selected intensity when they did not write within a specified time period. Secondary students with disabilities demonstrated improvements in writing quantity and quality when provided teacher feedback in the form of prompting.

Systematic, random, and/or specific feedback can be provided consistently in a one-on-one setting, but regular education high school classrooms may include 30 students, and resource or intervention rooms may have ten or more students with one teacher. Self-monitoring is one validated instructional method that can increase the amount or quality of feedback for students without requiring individual attention. Self-
graphing is a method of self-monitoring in which a student observes his or her own behavior/performance and creates a graph (Cooper, Heron, & Heward, 2007). Self-graphing of multiple types of behaviors have demonstrated benefits for students, and the writing fluency of elementary-aged students has shown improvement after self-graphing of CBM (Kasper-Ferguson & Moxley, 2002; Stotz, Itoi, Konrad & Alber-Morgan, 2007). Self-graphing of writing behaviors creates a visible, durable point of reference for students as they write. The process of measuring a behavior and creating a graph converts an ambiguous concept, such as writing fluency, into a concrete and observable dimension of writing that is readily available to make comparisons between present and past performance as needed and over time.

In a study of 24 regular education 4th grade students, Kasper-Ferguson and Moxley (2002) studied freewriting, class graphing, self-graphing, proofreading, and sharing in a yearlong writing package. Two to three times a week throughout a school year students participated in a five-minute timed freewriting on assigned and self-selected topics. Elbow (1981) argued that the syntactic flow seen in freewriting made it the best method for writing practice and for getting words on paper. In the study students were instructed to see how many words they could write and to write quickly, but legibly. They were given notice when one minute remained. Early in the school year student counted their total number of words, passed their papers to a peer to confirm the count, and called out their total of number of words when asked. Each month a graph was created that showed the class total. Stickers were added to the chart whenever the class total exceeded previous best scores. The class exceeded a class best total over fourteen occasions during the year.
After approximately two months of school, students began creating an individual bar graph of total number of words written. This graph was updated after each session and kept in a folder. By mid-year students began proofreading and sharing their projects after writing and graphing. Although not conducive to a component analysis, the data generated and the methods used were consistent with research on writing instruction in an applied setting. Writing instruction in classrooms incorporates multiple aspects of instruction that change over time as teachers respond to student interest and performance. Results of the yearlong packaged instruction showed continuous growth for all students with no sign of ceiling effects. The writing rates of all students improved over the course of the year as did the quality of the writing, but a noticeable upward trend was seen in writing more words per minute when students self-graphed immediately after writing, engaged in proofreading, shared their products more frequently, and wrote on more self-selected topics. Whereas maturation effects would be expected in any yearlong study of writing, the positive change in slope that occurred after students began self-graphing was greater than would be expected from maturation alone (Kasper-Ferguson & Moxley, 2002).

Self-graphing as an isolated component was studied using a multiple baseline across subjects design by Stotz, Itoi, Konrad, and Alber-Morgan (2008). Participants were three 4th grade students with high incidence disabilities, demonstrated deficits in written expression, and IEP writing goals. Language arts instruction took place in a self-contained classroom that utilized a direct instruction methodology and included frequent administration of curriculum-based writing measures. In the baseline condition, data
were collected daily on participant writing. Instruction and writing procedures were the same during the intervention phase with the exception of the addition of the self-monitoring component.

During intervention, participants wrote under timed conditions as usual but then moved to an area to meet with the interventionist who taught them to count and graph total words written. After self-graphing, the students returned to the class. After the intervention phase, participants were asked to continue to self-graph after writing with no prompting from the teacher or interventionist. Participants entered the maintenance phase after demonstrating mastery of the intervention and a positive response to intervention. The collection of maintenance data for each participant began when the next participant moved into intervention phase. Participants were in maintenance phase from three to twenty days depending on time of entry. A delayed assessment of maintenance was not possible during this study due to the school year ending. All students showed an increase in TWW and CWS after self-graphing was introduced, and gains continued throughout maintenance phase. A functional relationship was demonstrated between self-graphing and improved writing quantity and quality (Stotz, Itoi, Konrad, & Alber-Morgan, 2008).

Both studies lend support for further research in self-graphing and elementary students. No studies on self-graphing and writing fluency at the high school level were located; however, the results from cited studies and the synthesis of studies of self-monitoring and production (Rogers & Graham 2008) suggested that self-graphing warrants further study in elementary students and this research needs to be expanded upon with older students.
Repeated Reading and Repeated Writing

Harriman and Gajar (1986) cited the conclusions of Perl (1979) in support of the original conceptualization of repeated writing as a specific intervention for older students with disabilities. Perl had studied the writing and revising behaviors of unskilled college writers (n=5) and concluded that students demonstrated a lack of flexibility in working with their own written texts. They inaccurately reread what they had produced and misperceived what had been written (i.e., read their own text through the lens of what they meant to write rather than what they actually wrote). Often, they realized that something was wrong but could not identify the problem or how to revise it. The author noted that students had difficulty with perspective taking and assumed that the reader and the writer shared a common knowledge base and perspective. And lastly, she concluded that poor college writers had difficulty redirecting ideas once a pattern had been established in a text.

Repeated writing was originally conceptualized by Harriman and Gajar (1986) as an intervention to overcome inflexibility in unskilled writers by providing “multiple opportunities to write on the same topic without imposing the constraints of a previous draft” (p. 36). The authors based the practice of repeated writing on the positive findings from the first decade of research on repeated reading. The practice of repeated reading was grounded in the theory that cognitive capacities were limited and that automaticity of skills required for reading would reduce attentional demands and allow for simultaneous or higher level processing. The repeated reading of passages in which students decoded
the same words and sentences to the point of mastery (fluency) would increase automaticity of skill and ultimately improve reading comprehension (LaBerge & Samuels, 1974).

In a study of 48 randomly assigned students with LD, Harriman and Gajar (1986) investigated writing fluency under four conditions: writing to a different topic with mechanics cues, writing to a different topic with structure cues, writing to the same topic (repeated writing) with structural cues, and repeated revision with structural cues. In the latter two conditions, students wrote on the same topic for five days, although, in the repeated writing condition, students created a new composition daily. In the repeated revision condition, students revised and rewrote their draft from the previous day. Mechanical cues included capitalization, punctuation and writing complete sentences. Structural cues included writing a topic sentence, including detail, and writing a “clincher” sentence. Video vignettes provided the writing prompt.

All groups showed significant pre-test to post-test gains on general fluency factors including production and application of cues. An analysis of instruction in mechanics versus structure showed that students receiving instruction in mechanics made significantly more progress. When students were asked to write on a new topic, repeated writing and repeated revision did not demonstrate a differential effect on measures of fluency. A significant limitation of the study was the brief period of instruction. Although statistically significant improvements on indicators of writing fluency occurred after only five writing sessions, students did not write under one condition long enough for potential differences to become detectable. The study supported daily writing
practice with instruction in mechanics, but failed to produce findings that closely paralleled outcomes from studies that examined the effects of repeated reading (Therrien, 2004).

Each experimental condition required students to write for approximately 20 minutes daily for five days, a practice that resulted in improvements in fluency, but no group wrote and then wrote again or wrote until reaching mastery on any dimension of quality or quantity. The authors introduced the concept of repeated writing as an extension of repeated reading but failed to create experimental conditions that were procedurally similar to repeated reading. Results demonstrated that writing to the same topic across a period of days was no more or less effective than writing to a different topic each day. This suggested that writing practice, in and of itself, improved writing fluency. It should be noted that this study was significant in so far as the researchers studied high school students with LD. Moreover, this study was significant because it demonstrated improvements in fluency for the sample of students even though the intervention was relatively brief.

In a dissertation study of three 5th and 6th grade students with learning disabilities and emotional disturbance in a residential setting, Bauernschmidt (1991) utilized an ABAB design to study repeated writing to improve writing fluency. Bauernschmidt extended the work of Harriman and Gajar’s (1986) with younger participants. The researcher mainly focused on the finding of the repeated writing condition. Bauernschmidt’s results were inconsistent with the findings of Harriman and Gajar (1986); however, Bauernschmidt’s participants were younger and the intervention protocol was different. Under both conditions in Bauernschmidt’s (1991) study, students
were asked to think for 30 seconds and then begin writing after hearing a story starter. Participants had three minutes to write. Under A conditions, students wrote to a different story starter every day for five days. Under B conditions, students wrote to the same story starter each day. All participants demonstrated accelerated writing rates during repeated B conditions and decelerated or remained stable during A conditions. The pattern was evident on several measures of fluency: legible words, correctly spelled words, and correct sequencing of words. The author stated that some evidence of improvement was seen in percent of correct word sequences. No change was seen in the number of large words or the mean length of correct word sequences, a lack of change the author attributed to the function of time and development. The intervention took place over a period of one month.

In addition, some evidence of transfer (or retention) of skill was evident in the slope of the students’ writing in the second B condition. All students demonstrated an accelerated rate of writing in the second B condition when compared to both A conditions and the first B condition; however, only one student demonstrated a higher total number of words initially written in the second B phase. Limitations of the study include the small number of participants, relatively short period of intervention, and the fact that the study took place in a residential setting. Bauernschmidt (1991) did demonstrate experimental control across participants and detected change in writing fluency as measured by curriculum based measures under repeated conditions. As seen in the pervious study, the author utilized repeated writings across days, technically meeting a denotation of repeated writing.
Higher rates of writing were correlated with higher quality in writing in a few studies (Kasper-Ferguson & Moxley, 2002; Rosenthal, 2006; Stotz, Itoi, Konrad, & Alber-Morgan, 2008). In the original discussion of repeated reading as a method of instruction, Samuels (1997) compared high levels of reading fluency with music and sports, two other areas that require high levels of performance. Both sports and music are characterized by repetition in practice and practice to a degree that athletes do not have to consciously think about how to execute a play and musicians are able to glance across bars of written notes and create music that is pleasing to the ear. To achieve such fluency of behavior, coaches run repeated drills, and music teachers require performing the same piece and sections of pieces repeatedly until individual notes retreat and music emerges.

Samuels captured a logical parallel. Indeed, it is difficult to bring to mind any complex behavior that does not improve with practice, especially practice with feedback of high quality. Few individuals will pay for private music lessons from a ten-year-old violinist, but for a professional violinist, practice and feedback with Itzhak Perlman is priceless. And Samuels codified a procedure universally understood by preschoolers with access to books. What parent has not heard, “read it again…again…and again” from their preschooler? Even the very young figure out quickly that the more they do something, the easier it becomes.

Thus began repeated reading, a practice grounded in the theory of automatic information processing/skill appropriation (LaBerge & Samuels, 1974) as well as common sense. After reviewing 200 studies of repeated reading, Samuels concluded that a high degree of accuracy and speed develop with practiced text, there is transfer to other
texts (even those not practiced), it is the most universally used remedial reading
technique with poor readers, and it is widely used to teach reading in foreign languages
(Samuels, 1997).

In a meta-analysis of fluency and comprehension gains and repeated reading,
Therrien (2004) concluded that repeated reading improved reading fluency of students
with and without disabilities. The author noted that only disabled students with LD had
been studied. Passage comprehension improved with repeated readings of the same
passage. Transfer effects to new reading materials were moderate for both fluency and
comprehension; however, it was noted that all repeated reading interventions should be
done with students reading to an adult as fluency and comprehension indicators with
adult administered intervention were three times more effective than when students read
with other students.

Although there were negligible differences between types of cues (i.e., prompts to
focus on fluency, speed, or speed and comprehension), a meta-analysis of procedures
clarified optimal conditions. Students should be provided with a cue and the passage
should be read three to four times if the goal is for students to fluently read and
comprehend a particular passage; however, if the goal is to improve overall fluency and
comprehension (i.e., transfer), then corrective feedback should be provided and passages
read until an appropriate criterion is met. Interventions that used a performance criterion
demonstrated an effect size that was four times greater than interventions that used a
fixed number of readings. Repeated reading interventions that included corrective
feedback from an adult demonstrated a mean fluency effect size of 1.37, and adult
implemented interventions that included student or adult charting of progress
demonstrated a mean fluency effect size of 1.58. Effect sizes that included adult and peer feedback showed a much smaller gain (ES=.51) for fluency and comprehension (ES=.23). A corresponding effect size of adult feedback or charting on comprehension could not be determined. The author concluded that preliminary results may support the use of charting to improve reading fluency (Therrien, 2004).

To achieve a truer procedural parallel between repeated reading and repeated writing, students would need to write to the same prompt in close temporal proximity. With repeated reading, students read the same passage repeatedly during the same session and may review previously mastered passages in later sessions, but student re-reading does not occur across a period of days. Existing studies of repeated writing failed to replicate the temporal dynamics of repeated reading. Further, repeated reading results are enhanced by adult feedback and charting of performance. Similar benefits of feedback and charting of performance have already been demonstrated in other types of writing research. Existing studies of repeated writing as well as studies of feedback and self-graphing and writing suggest that repeated writing with self-graphing and feedback may be a viable intervention for improving the quality and quantity of written products of poor writers.
Chapter Three: Methodology

This chapter describes the methods, subjects, demographic information, and logistical procedures of the study. The following are discussed: subject selection, participant profile, setting, role of the researcher, materials, definition and measurement of the dependent variables, experimental design, experimental procedures, measures of social validity, interscorer agreement and treatment integrity.

Subject Selection

Participants were eight high school students receiving services from special education due to identified or suspected disabilities. The high school is the only high school in a suburban district in Central Ohio that serves approximately 7,000 students. The high school serves grades 9 through 12. State Department of Education records from 2008-2009 report that the racial background of students in the district are as follows: Black, non-Hispanic 16.5%, American Indian or Alaskan Native 0.2%, Asian or Pacific Islander 3.2%, Hispanic 2.2%, Multi-Racial 5.6%, and White, non-Hispanic 72.2%. Approximately 20% of students in the district are identified as economically disadvantaged, and approximately 16% are identified as students with disabilities. Less than two percent of students have limited English proficiency.

In the cooperating district for this study on the 2009 Writing OGT, 94.9% of 10th grade students performed at or above the Proficient Level; however, there were noticeable differences between the passing rate and scoring category of students.
with and without disabilities. District-wide, only 75.1% of students with disabilities earned passing scores. Whereas 2.8% of non-disabled students earned failing scores in the Basic Range, 17.6% of students with disabilities earned similar scores. Within passing categories, the majority of scores for non-disabled students (59.1%) fell in the Accelerated Range whereas the majority of scores for disabled students (55.5%) fell in the passing, yet lower, Proficient Range (Ohio Department of Education, 2010).

Non-disabled students were four times more likely than students with disabilities to score in the Advanced Range, but students with disabilities were 24 times more likely to earn a score that fell in the lowest (Limited) range. Across the board, students with disabilities demonstrated dramatically different writing skills than their non-disabled peers. Across academic domains within the Proficient Range of scores, the greatest disparity between scores of students with and without disabilities was in Writing with an absolute difference of 26 percentage points in contrast to a difference of .4 points in Reading, 6.5 points in Mathematics, 2.6 points in Science, and 5.2 points in Social Studies (Ohio Department of Education, 2010).

Students were recruited after obtaining approval to conduct the study from the building principal, school board, university’s office of outreach and extension, and the university’s Institutional Review Board. Students were recruited through the high school curriculum director. The curriculum director identified students who had either failed the Writing portion of the Ohio Graduation Tests, were demonstrating difficulty with writing during classroom work, and/or had been referred by teachers to the school’s Intervention Assistance Team for academic difficulties that included problems with writing. In addition to being identified by the school as a student in need of writing intervention,
potential participants were required to have a scheduled study hall, aide period, or an English intervention period during which the study intervention could take place. The curriculum director phoned the parents of potential participants to gain consent for contact information to be shared with the researcher. Parents who had expressed interest to the curriculum director were contacted by the researcher in the order that names were received until parental consent (appendix A) and student assent (appendix B) was obtained from eight participants. Adult consent (appendix C) was obtained from two students after they turned eighteen during the study. Study participants were then randomly assigned to one of two groups.

**Participant Profiles**

Participants were asked to make up their own pseudo-name at the beginning of the first session. That name, as spelled by the participant, was placed on a folder that contained their work. Confidentiality and the need for a pseudo-name was explained, and participants were asked to use that name on any study related document. Group I participants included Tina, Nasha, Julius, and Abbygail. Group II participants included James, Angel, SpongeBob, and Juggaletta. Grade point averages (GPA) are based on a 4.0 scale. Ability scores, achievement scores, and disability status were taken from the most recent multi-factored evaluations (MFE) for special education and from cumulative school and special education records. In most cases not all subtests were given as part of standardized testing; therefore, information available across individuals was highly variable. Verbal and Nonverbal ability scores are reported as available. Of available achievement scores, only those related to reading and writing are reported. Unless
otherwise indicated, scores are standard scores (SS) with a mean of 100 and a standard deviation of 15. A passing score for Ohio Achievement and Graduation Tests is 400. Participants were right-handed unless otherwise noted.

**Tina.** Tina was an 11th grade African-American female receiving special education services under the category of Other Health Impaired for Attention Deficit Hyperactivity Disorder (ADHD) and history of epilepsy. During the study, she was taking stimulant medication for ADHD but had not experienced a seizure in several years. Her GPA at the end of the study was 2.06. An MFE completed in 2008 reported the following scores on the Woodcock-Johnson Tests of Cognitive Abilities III: Verbal Ability 75, Thinking Ability 86, and Intellectual Ability 72; Wechsler Intellectual Achievement Test II: Reading Comprehension 66, and Spelling 82. On the Spring 2009 Ohio Graduation Tests, Tina earned the following scores: Reading 374 (Limited), and Writing 383 (Basic).

Tina reported that passing the graduation tests was of paramount importance. For instance, she stated, “If I do this, will I pass the test?” meaning that if she participated in the study, would it lead to passing the test. The researcher responded that many things contribute to earning a passing score and that although the activities involved in the study might improve her writing fluency and skills, it was not possible to know the outcome of an experiment prior to implementation.

**Julius.** Julius was a 12th grade Caucasian male receiving special education services for a Specific Learning Disability in Written Expression. Julius also has a history of ADHD but was not taking any medications during the study. His GPA at the end of the study was 2.0, and he was completing his final semester before graduating. An
MFE completed in 2006 reported the following scores on the Kaufman Brief Intelligence Test, Second Edition: Verbal IQ 120, Nonverbal IQ 120, and Full Scale IQ 123; Woodcock-Johnson Test of Achievement III: Passage Comprehension 117, Writing Samples 99, and Writing Fluency 74. Julius had passed the Ohio Graduation Tests in 2008 with the following scores: Reading 422 (Proficient), Writing 421 (Proficient). Although his overall writing score fell in the proficient range of scores, he had not met proficiency standards in Writing Conventions and Applications. Julius is left-handed and his handwriting was often illegible. Julius was observed to obscure poor spelling with his handwriting.

**Nasha.** Nasha was an 11th grade African-American female receiving special education services under the category of Specific Learning Disability in Basic Reading Skill, Reading Comprehension, and Reading Fluency Skills. Her GPA at the end of the study was 1.98. An MFE completed in 2007 reported the following scores on the Woodcock-Johnson Tests of Cognitive Abilities III: Verbal Comprehension 79, Concept Formation 96, and Brief Intellectual Ability 86; Woodcock-Johnson Tests of Achievement III: Passage Comprehension 69, and Writing Samples 94. However, the evaluator noted that her writing contained many spelling errors and fragments. On the Spring 2009 Ohio Graduation Tests, Nasha earned the following scores: Reading 383 (Basic), and Writing 394 (Basic). Nasha received free or reduced meals at school.

Nasha presented as an engaging and happy student. Although Nasha’s current areas of disability did not include receptive or expressive language or writing, she had received speech and language services throughout elementary school. In conversation with Nasha, it was immediately evident that she often misunderstood directions and
prompts, so the researcher adjusted her rate of speech and queried for comprehension when task demands changed and after reading prompts. Nasha’s handwriting was easily legible.

**Abbygail.** Abbygail was a 10th grade Caucasian female receiving special education services under the category of Other Health Impaired for ADHD and depression. In the two weeks prior to starting the study, Abbygail had been diagnosed with Bipolar Disorder. At the end of the study, her GPA was 1.99. An MFE completed in 2002 reported the following scores on the Woodcock-Johnson Tests of Cognitive Abilities: Verbal Ability 92, Thinking Ability 92, and GIA 93; Woodcock-Johnson Tests of Achievement III: Reading Comprehension 85, and Written Expression 89. Her current Individualized Education Program (IEP) included the goal that she would be able to write an essay, which included an introduction, body, and a conclusion containing no more than ten spelling and writing errors. In 2007 Abbygail earned an overall passing score on the Writing Ohio Achievement Test of 401, but scored below proficiency in Conventions and Processes. In 2008 she scored in the Basic range (387) on the Reading Ohio Achievement Test. Abbygail received free or reduced meals at school.

Abbygail was present for the first two weeks of the study but her mood varied from day to day. During several sessions, she only stopped talking while writing, and during other sessions, she wiped tears while writing and had little to say. While still in Phase I, Abbygail informed the researcher that she had begun taking six new medications that included a mood-stabilizer, an anti-psychotic, an anti-depressant, and a stimulant medication to be taken during the school day. Abbygail was consistently absent after that
conversation and was dismissed from the study after seven consecutive absences. Abbygail’s mother called the researcher several times to let her know that the absences were related to changes in medication.

**SpongeBob.** SpongeBob was an 11th grade African-American female receiving special education services for a Specific Learning Disability in Written Expression. An MFE completed in 2003 reported a General Intellectual Ability of 115 on the Woodcock-Johnson Tests of Cognitive Ability III, and Reading Comprehension and Written Expression scores of 96 and 83, respectively on the Woodcock-Johnson Tests of Achievement III. SpongeBob had earned the following scores on the Spring 2009 Ohio Graduation Tests: Reading 421 (Proficient), and Writing 417 (Proficient). SpongeBob had been referred to the Intervention Assistance Team due to difficulty producing written responses during testing that were consistent with content mastery demonstrated in other testing formats.

SpongeBob played multiple sports and worked hard to make Bs and Cs in classes. Her homework grades were consistently higher than her test grades, especially essay tests. Her handwriting was very legible.

**James.** James was a 9th grade Caucasian male receiving special education services under the category of Specific Learning Disability in Written Expression, Basic Reading Skill, Reading Comprehension, Math Calculation, and Math Reasoning. His GPA was 3.16 after his first semester of high school. An MFE completed in 2009 reported the following scores on the Kaufman Brief Intelligence Test, Second Edition: Verbal Reasoning 95, Nonverbal Reasoning 95, and Full Scale IQ 89; Wechsler
Individual Achievement Test, Second Edition: Reading Composite 79, and Writing Composite 87. No Ohio Achievement Test results were available. James was cooperative throughout the study. His handwriting was easily read.

**Angel.** Angel was an 11th grade Caucasian female receiving special education services under the category Other Health Impaired for an Auditory Processing Disorder. Her GPA at the end of the study was 1.74. An MFE completed in 2008 reported a Brief Intellectual Ability score of 81 on the Woodcock-Johnson Tests of Cognitive Ability and Broad Reading and Written Expression scores of 73 and 90, respectively. It was noted that Angel’s writing fluency was slow and that she was inconsistent with capitalization and punctuation. Angel earned the following scores on the Spring 2009 Ohio Graduation Tests: Reading 397 (Basic), and Writing 410 (Proficient).

Angel wrote with her left hand until six months before the start of the study when she received a spiral fracture of her radius while playing sports. Angel stated that it was too painful to hold a pencil in her left hand and began writing with her right hand in April 2009. Angel disclosed this information when she signed the assent form, but the researcher followed up with the school nurse to determine if Angel still needed medical attention and if she could safely participate in the study. Angel insisted that she had written with her right hand for months and wanted to be in the study. All writing was done with her right hand. It is likely that Angel will be right handed permanently. Angel’s speech articulation was occasionally difficult to understand, but she engaged in conversation and writing tasks easily. Her handwriting was relatively poor for a dominant hand, but quite legible given that she was still developing writing proficiency with a non-dominant hand.
**Juggaletta.** Juggaletta was a 10\textsuperscript{th} grade Caucasian female who transferred to the school at the beginning of the current school year. She had not received special education services at her previous school, but was referred to the Intervention Assistance Team within the first two weeks of school due to poor academic work and difficulty with writing. Due to fines at her previous school, the only records available at the beginning of the study were report card grades from her 9\textsuperscript{th} grade year, which included Ds and Fs in all subjects. After one semester at her new school, Juggaletta’s GPA was 0.65. During the last weeks of the study as part of an MFE, Juggaletta received the following scores on the Cognitive Assessment System: Planning 62, Simultaneous 94, Attention 68, and Successive 103; Woodcock-Johnson Tests of Academic Achievement III: Reading Fluency 69, Understanding Directions 92, Spelling 72, and Writing Fluency 69. By the end of the study, she had started receiving free meals at school.

When signing the parental consent form, Juggaletta’s mother indicated that she wrote better with one eye closed. Juggaletta was never observed to close one eye while writing. Her handwriting was large and immature for her age, and her spelling, gaps between and within words, and lack of punctuation often made responses difficult to read.

**Setting**

The study was conducted in a reference room adjacent to the high school library. The room was approximately 20’x 20’ and was lined with bookshelves along all walls. The room contained several tables with chairs. The room was reserved for the researcher and participants two to three days a week so that there were no interruptions during sessions. When the door to the library was closed, no one could see into the room.
location allowed for confidentiality of participants as they were able to check in and out of the library along with many other students, and it allowed for a quiet, uninterrupted place to work. The room was well lit, climate controlled and did not have a telephone. The room did have a speaker for public announcements and an alarm for fire and/or lock down drills.

**Role of the Researcher**

The researcher administered all baseline and intervention phases. The researcher was familiar with the district and the building after completing a full time internship in school psychology during the previous school year. The researcher was a Caucasian female and a doctoral candidate in the School Psychology program at The Ohio State University who holds a degree in education, had teaching experience in writing with high school students, and had sufficient training to administer, score, and interpret results of the study.

**Materials**

Materials used in this study included regular ruled loose leaf notebook paper, a paper folder with clasps and pockets, a ball point ink pen and mechanical pencil, a stopwatch, typed writing prompts printed one per page on white printer paper bound in a three ring binder, graph paper, red and blue colored pencils, and phase scripts in a three ring binder.

**Definition and Measurement of the Dependent Variables**

The dependent variable was writing fluency, defined as "the amount of text written and the skill or ease with which it is generated" (Robinson & Howell, 2008, p. 444) as measured by the following: (a) Total Words Written per 3 minutes (TWW),
(b) number of Correct Minus Incorrect Writing sequences per 3 minutes (CIWS), (c) number of Words Spelled Correctly per 3 minutes (WSC), (d) number of Correct Punctuation Marks per 3 minutes (CPM), and (e) Percent Correct Sequences per 3 minutes (%CS). The protocol for scoring each dependent variable is included as appendix D.

Data Collection

Participants entered the room and sat at a table set with materials. Participants and the researcher sat at the same table and in the same seats each session to establish behavioral patterns and expectations. The researcher sat to the right and at an angle from the participant. Prior to arrival, the table was set with the student’s work folder, three pieces of regular ruled paper, a pen and pencil, and a closed prompt binder. As participants progressed through phases, a graph and colored pencils were added and placed to the left of the work folder. The researcher always had a stopwatch and an intervention script in an open binder in front of her.

Participants sat down and engaged the evaluator in brief conversation about their school day or weekend activities. The researcher began reading the appropriate intervention script and opened the prompt binder to the appropriate page. The prompt was read to participants to prevent written responses being negatively impacted by participants' reading ability. The prompt was reread and/or words explained at participant request. Timing with a stopwatch began at the end of explanation. In the case of Nasha, the procedure was modified such that the prompt was read slowly with pauses after phrases. If Nasha asked a question or made a comment that indicated comprehension, “think time” started without further query. Because Nasha had
demonstrated difficulty understanding some early prompts, the researcher asked a simple question after reading the prompt to check for understanding if Nasha remained silent after hearing the prompt.

After the prompt was read, participants had one minute to think (referred to as “think time”) and then five minutes to write. At the three-minute point, participants were prompted by the researcher tapping their paper to place a slash mark after they completed a word. Several participants ignored the directions and placed a slash mark in the middle of a word and then continued writing. For scoring purposes these lines were moved to the end of the word. Only the first three minutes of writing was scored.

Participants were thanked for working hard. They left the reference room and either the librarian signed their pass back to class or they remained in the library studying for the remainder of the period. Once students checked out of large study halls to go to the library, study hall monitors asked that they remain in the library studying throughout the period if possible.

**Design**

This study utilized a multiple baseline across subjects design (Baer, Wolf, & Risley, 1968). If the implementation of the independent variable(s) results in a behavioral change as measured by the dependent variable(s), experimental control within the individual is demonstrated by change after the point of application of the independent variable(s). A claim of experimental control is strengthened if change is observed across participants when the treatment is implemented at different times. Data was collected simultaneously from all participants under baseline conditions for at least three sessions or until individual norms are evident in consistency of data. Implementation of the
intervention is staggered between participants with participants remaining in the baseline condition until others either demonstrate a consistent effect or have experienced the independent variable long enough to demonstrate no effect.

Once writing skills are taught and/or practiced, they cannot be unlearned; therefore, a reversal design would not be compatible with a writing intervention. Although not conducive to subsequent microanalysis of independent variables, a multiple baseline across subjects design allowed for a demonstration of the effects of the independent variables while allowing for the flexibility in timing necessary in a large public high school (Kennedy, 2005). This design allowed for some component analysis of the intervention because one group of participants was introduced to a complex intervention one component at a time.

Participants assigned to Group One moved through four phases of increasing complexity, whereas, participants assigned to Group Two moved from Phase I: Baseline to Phase IV: Self-graphing (SG), Repeated Writing (RW), and Feedback (FB) without ever completing Phase II: SG or Phase III: SG & RW. Altering the administration between groups allowed for an evaluation of sequence effects. It was not practical to determine cut points a priori for moving participants between phases. Implementation of change was based on the visual inspection of TWW within and across phases and participants. In both groups participant one remained in Phase I until data points from TWW showed 3-5 sessions with consistent performance, defined as limited variability and/or negative slope within visually inspected data. That person then moved to either Phase II or Phase IV with other participants remaining in Phase I. Subsequent participants remained in their current phase until the previously moved participant
demonstrated either a stable change in performance or several data points indicating no change. Decisions to move participants between phases were made in consultation with the researcher’s doctoral committee members.

Because Group One was exposed to components of the intervention in isolation, it was possible for Phases I, II, and III to serve as a baseline for Phase IV if the component “feedback” was the critical component of the intervention. A minimum of three data points were collected within each phase for each individual with the exceptions of Nasha who moved after one session in Phase IV and Abbygail who was dismissed due to excessive absences.

**Independent Variables**

The independent variables for Group I were self-graphing, repeated writing, and feedback. The independent variable for Group II was the combined writing intervention of repeated writing with self-graphing and feedback.

**Procedures**

Four phases were implemented with Group One during this study including Phase I: Baseline (BL), Phase II: Self-graphing (SG), Phase III: SG and Repeated Writing (RW), and Phase IV: SG, RW and Feedback (FB). Two phases were implemented with Group Two during this study: Phase I and Phase IV. During each phase, participants provided two written responses to either one or two prompts, depending on phase. Prompts were randomized after three English teachers at the participating high school judged the list of prompts to be appropriate for high school students and of parallel structure. Participants completed prompts in binder in order from front to back while in Phases I and II. Participants completed prompts in binder from back to front once they
moved into either Phase III or IV so that all repeated writing prompts would be consistent across participants. This allowed for comparison across participants of prompt quality.

Writing prompts used in the study are included in Appendix E. Each phase had a standardized full script and an abbreviated script (appendix F-M). The full script was used at the point of phase change at least twice or until the participant demonstrated understanding of protocol and appeared bored with lengthy directions.

**Phase I: Baseline.** During Baseline, participants provided a written response to two different prompts. Participants were asked to write the best response they could as quickly as they could when responding to the first prompt and then to try and write more when responding to the second prompt. After the session, the researcher scored and graphed all dependent variables, but the participant was unaware of any assessment.

**Phase II: Self-graphing.** As in Baseline, participants were asked to write twice to different prompts using the same intervention script; however, after each response the researcher counted the number of words written out loud and the participant graphed the number on a graph that included results from the last three Phase I writings. Per session, first writings were shaded in red and second writings in blue allowing participants to immediately visualize a pattern and understand the metric being used to evaluate their writing.

**Phase III: Self-graphing and Repeated Writing.** During Phase III, participants wrote and graphed as in Phase II; however, they responded both times to the same prompt. Participants were asked to write a second time as though they had not written on the topic before but, again, to try and write more than they wrote the first time.
**Phase IV: Self-graphing, Repeated Writing and Feedback.** During Phase IV, participants wrote and graphed as in Phase III, but were provided feedback on spelling, punctuation, sentence structure, and usage in their first response. Participants were then asked to incorporate feedback into their second writing and try to write even more than they had written the first time. Specific feedback was not given on the second writing; however, reinforcement was provided in the form of positive comments such as, “You wrote a better thesis statement this time. Nice work.”

**Social Validity**

Educators are more likely to utilize academic interventions over time if students, teachers, and parents perceive interventions to be worthwhile and acceptable regardless of treatment effects in isolation (Wolf, 1978).

**Goals.** Given the need to respond to expository prompts in many academic and professional settings across the lifespan, increased writing fluency is also of indisputable social significance. Whereas some would argue the social validity of requiring an exit test in writing, few would argue the social significance of passing such a test. Presently, in Ohio students are required to write two essays as part of a high school exit exam. Failing this exam is demoralizing for students; therefore, improving the quality and quantity of writing for students who have either failed the Writing OGT or at risk of failure is a goal of both intrinsic and extrinsic value.

**Procedures.** Information was collected via survey from participants, parents, and teachers (appendix N-P) to determine personal perceptions of intervention and acceptability/utility for continued or expanded use in the classroom. Two attempts were made via personal, email, or phone contact to secure returned questionnaires.
**Effect.** Given that the ultimate goal of fluent writing is effective communication with others, in addition to assessing quantitative dimensions of writing, the practical utility of the independent variable on student writing was assessed post study through a blind rating by educators familiar with secondary curriculum of participant writing samples. Three educators holistically scored the last initial writing in Phase I and a randomly selected initial writing from Phase IV per participant. They holistically scored an initial and second response selected from sessions 1-3 of Phase IV that had the largest discrepancy in CWS for each participant and indicated the superior written response of each paired set by placing a sticker on the better writing. They also placed a different sticker on any written response that they judged to be of sufficient quality, albeit incomplete, to earn a passing score on the Writing OGT.

**Interscorer Agreement**

A graduate student was trained in the scoring of TWW, CWS, and IWS to complete and independent assessment. This independent data collector scored 20% of participants' written responses selected proportionately and randomly to provide evidence of reliability in scoring. Interscorer agreement for TWW, CWS and IWS were calculated using the following formula: agreements/agreements+disagreements x 100. For reliability of TWW, word counts were compared for agreement or disagreement across all selected compositions for one average. Other dependent measures were calculated as agreements and disagreements per composition and then averaged. Dependent variables not considered when moving students between phases (WSC, CPM) as well as dependent measures derived using CWS and IWS (CIWS, %CS) were not independently verified.
Treatment Integrity

To establish fidelity during implementation, an independent data collector observed seven different sessions. Observed sessions included six different participants and Phases I, II and IV. Because Phase III is incorporated into Phase IV, the independent data collector had the opportunity to observe all components of the intervention administered. The independent data collector entered the room prior to the arrival of participants and observed entire sessions while comparing observed implementation of phase and a treatment integrity phase script. The independent data collector was directed to note any deviations on her copy of the script and add the date, time, subject and her signature. Students were introduced to the observer when they entered the room and told that she was there to observe the investigator. Treatment integrity was reported as the number and type of deviations observed.
Chapter Four: Results

This chapter presents the results of the study per participant and as two experimental groups. Multiple indicators of quality were assessed despite some overlap between dependent variables. The chapter begins with a discussion of reliability as measured by interobserver agreement and treatment integrity. Research questions One through Three were examined using averages across and within phases as well as visual inspection of graphed data.

Due to high variability across participants and sessions, research questions One through Three were answered based upon averages of all prompts written under phase condition. It was assumed that change in fluency would be evident in both first and second writings, first writings as evidence of transfer and retention of skill and second writings as evidence of practice and immediate intervention effects. Change scores per phase and per dependent variable are provided for averaged data of Prompts 1 (P1) and Prompts 2 (P2). Averaged data per phase included Prompt 1 from the next phase because participants received new task demands between first and second writings at the point of phase changes. Standard deviations were not calculated as such a statistic would not provide a reliable metric across phases and participants. The number of data points per phase (Prompts 1 and 2) ranged from seven to twenty-nine across participants.
Variability was best assessed through visual inspection of graphed data and change scores. Percent non-overlapping data (PND) was calculated per phase and represents the percent of data points in that phase that fell above the highest data point collected in Phase I: Baseline. Scores below 50% represent no effect. Scores between 50% and 70% represent a small effect, and scores over 70% represent a moderate to large effect (Scruggs & Mastropieri, 2001).

Percentile rank per grade of Phase I: Baseline average Total Words Written (TWW) is provided based on the Multi-Year Aggregate of TWW as reported on the AIMSweb Growth Table (2010); however, fall norms for high school students were based on samples of less than 400 students in contrast to norms for middle school students based on samples over 5,000 students and norms for late primary grades based on samples over 14,000.

Questions One and Two were evaluated with data from Group I because the research question involved a component presented in isolation to participants in Group I. Question Three was evaluated based on both groups because all participants experienced Phase IV. Research questions Four through Six were evaluated qualitatively based on second and third party feedback on process and product.

**Interobserver Agreement**

As indicated, an independent data collector was trained in the scoring of the primary independent variable, TWW, as well as components needed to calculate Correct Minus Incorrect Writing Sequences (CIWS): Correct Writing Sequences (CWS) and Incorrect Writing Sequences (IWS). Training occurred during two sessions. During the first training session, both data collectors scored non-participant writing samples until
interobserver agreement (IOA) for three samples exceeded 90%. During the second training session, both data collectors scored participant writings until meeting the same criteria for agreement for each participant. Participant writings used for the second training session were not used to establish IOA. The second session allowed evaluators to identify idiosyncratic aspects of writing that were likely to result in inconsistency between raters, such as one student’s tendency to write “th” with a tail ascending from the letter h. Because it was obvious that the student consistently failed to properly form the word “the,” it was decided that it would not count as a misspelled word. Another participant consistently formed the letters “a” and “u” indistinguishably. It was agreed that the failure to close the top of the letter “a” would not be scored as an error. Once scorers demonstrated consistency across participants, participant writings were arranged in session order. From a total of 308 individual essays, 62 (20%) were randomly selected across participants and phases to be scored a second time independently.

Of the 62 rescored essays, TWW was consistent across scorers for 58 essays. Four essays differed in TWW by one word resulting in an IOA of 93.54% for TWW. No differences in TWW between scorers were greater than one word.

Interobserver agreement was calculated for CWS and IWS per essay by comparing correct and incorrect markings per juncture between scorers. The total number of agreements was divided by the number of agreements plus disagreements and multiplied by 100 to establish an IOA for each essay. The average IOA across the 62 essays was 96.76% with a range of 93.75% to 100%.
Based on the overall agreement between data collectors on the dependent variables used to make decisions during intervention, it can be assumed that the reported data were reliably scored across participants throughout data collection.

**Treatment Integrity**

To verify that data were collected in a manner consistent with protocol and without deviation from intervention script, the independent data collector observed seven randomly selected sessions. A treatment integrity checklist was constructed by adding date, time, participant name, and a place for the observer to sign, date, and add comments to the phase scripts. The instructions stated that the observer was to follow the phase script and mark and describe any deviations between script and observations. Treatment integrity was 100% across all observed sessions with no noted omissions or substitutions. Across subjects and phases, the intervention was implemented consistently and according to protocol.

**Research Question One**

Does self-graphing of Total Words Written (TWW) improve writing fluency as measured by TWW, Correct Minus Incorrect Writing Sequences (CIWS), number of Words Spelled Correctly (WSC), number of Correct Punctuation Marks (CPM) and Percent of Correct Sequences (%CS)?
Tina. Tina was slow to warm up to the researcher, stated her opinion of writing prompts bluntly, and was easily redirected back to the task when distracted. Tina’s opinion of prompts did not correlate consistently with changes in data. Once during self-graphing, she stated that she did have much to say about that day’s topic after observing that her graphed data was lower than her previous marks; however, Tina was self-graphing TWW on the full five minutes of writing.

Participants graphed TWW for the full writing so that they would not change their writing behavior after the three-minute mark. Participants were instructed and then prompted to make a mark after three minutes of writing and then continue writing until five minutes had elapsed. Scoring for the purpose of the study was based on writing during the first three minutes; however, participants counted and graphed TWW from the full session due to experimenter concerns that counting to the three-minute mark would result in students slowing down in anticipation of the three-minute mark and/or not putting forth continuous effort after the three-minute mark if they perceived that only the first section of writing was relevant.

On two occasions, Tina stopped writing at four minutes and the experimenter followed the protocol, stated that she still had more time to write, and continued to look at the stopwatch. Type of prompt did not appear to be a factor on her performance scores across variables on three-minute writings. In some cases she had lower overall scores on topics she either stated or appeared to like and higher overall scores on topics she either discontinued prior to the five-minute mark or indicated that she disliked.
Tina’s handwriting occasionally interfered with gaining meaning from her writing. Tina formed letters consistently, albeit incorrectly, so both the experimenter and the independent scorer were able to accurately and consistently read her writing with practice. Phase I: Baseline was conducted in fall when Tina’s average TWW of prompts one (P1) and prompts two (P2) was 59 words per three-minute session, a score that fell at the 50th percentile for her grade (AIMSweb, 2010). Tina demonstrated variability across sessions and phases (see Table 1 and Figure 1) such that experimental control was not demonstrated. Averaged data per dependent variable and percent of non-overlapping data (Table 2) indicated that self-graphing performance on outcome variables did not improve writing fluency. In Phase II: Self-graphing, Tina demonstrated a slight decrease in TWW and WSC. The average number of CPM remained the same. Tina’s CIWS and %CS decreased. Data overlapped during self-graphing across dependent measures (see Table 2).
Table 1

*Tina: Raw Data Across Sessions by Dependent Variable for P1 and P2 with Change Score per Session*

<table>
<thead>
<tr>
<th>Session</th>
<th>Baseline</th>
<th>Self-graphing</th>
<th>Self-graphing with Repeated Writing</th>
<th>Self-graphing, Repeated Writing and Feedback</th>
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<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9 10 11 12 13 14 15 16</td>
<td>17 18 19 20 21 22 23 24 25 26 27 28</td>
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<tr>
<td>TWW1</td>
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<td>62 51 65 61</td>
<td>41 59 56 56 69 56 56 54 52 69 52 61 33 42 57 60 66 45 45 48 54</td>
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<tr>
<td>TWW2</td>
<td>65 67 50</td>
<td>59 60 66 63</td>
<td>54 70 61 46 69 71 65 71 69 54 70 54 57 43 59 51 50 52 54 54 58</td>
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</tr>
<tr>
<td>Change</td>
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<td>13 11 5 -10 0</td>
<td>15 9</td>
<td>17 17</td>
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<tr>
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<td>4 2 3 2</td>
<td>1 6 4 2 2 0 2 1 1</td>
<td>3 3 3 4 7 3 1 2 4 3 3 4</td>
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<td>1 1 2 2</td>
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<td>4 1 0 2 1</td>
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<td>Change</td>
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<td>4 -1 1 -2 2</td>
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<td>75 71 70 63</td>
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<td>-1 3</td>
<td>-3 8</td>
<td>4 2 0 -13 6 2</td>
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</table>
Figure 1. Tina: TWW and %CS for P1 and P2 per session
Table 2

*Tina: Mean of all P1 and P2 Data Points per Phase and Dependent Measure with Mean Change Between Prompts, Range within Phase, and Percent Non-overlapping Data*

<table>
<thead>
<tr>
<th></th>
<th>TWW</th>
<th>WSC</th>
<th>CPM</th>
<th>CIWS</th>
<th>%CS</th>
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</thead>
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**Julius.** Julius was easily engaged in tasks and attentive while writing; however, he was easily distracted during conversation and prone to tangential deviations in both conversation and text. He was eager to discuss his weekend activities, which included mixed martial arts tournaments and paramilitary activities. Julius was visibly interested in self-graphing his data when self-graphing was initially presented in Phase II. He frequently verbalized a desire to beat his highest score. After several sessions, his data exceeded the space provided on a horizontal graph and data had to be re-graphed in a vertical orientation.

Julius’s handwriting often interfered with comprehension. He was observed to produce ambiguously shaped letters. In addition to his poor spelling, Julius formed some words consistently with only part of a final letter formed. During Phase I: Baseline, Julius wrote an average prompt 1 and prompt 2 TWW of 68 words per three-minute writing, a score that fell between the 50th and 75th percentile for his grade (AIMSweb, 2010). Julius demonstrated variability across sessions and phases (see Table 3 and Figure 2). Averaged data per dependent variable and percent of non-overlapping data (Table 4) indicated that self-graphing may have had a small positive effect on writing fluency as measured by TWW and WSC and that the change in quantity did not occur at the expense of quality indicators. CPM, CIWS and %CS showed a small average improvement.
Table 3

*Julius: Raw Data Across Sessions by Dependent Variable for P1 and P2 with Change Score per Session*

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<th>SG, RW, and Feedback</th>
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Figure 2. Julius: TWW and %CS Per Session and Phase
Table 1

Julius: Mean of all P1 and P2 Data Points per Phase and Dependent Measure with Mean Change Between Prompts, Range within Phase, and Percent Non-overlapping Data

<table>
<thead>
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<th>CPM</th>
<th>CIWS</th>
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<td>21-59</td>
<td>66-95</td>
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**Nasha.** Nasha demonstrated difficulty with fluent conversation early in the study and the experimenter accommodated this difficulty by speaking more slowly and in shorter sentences. Directions were read with pauses in appropriate places to allow for additional processing time. Nasha demonstrated comprehension of the tasks through performance. Prompts were read in a similar way. Nasha often either asked for clarification of a prompt or expressed an opinion of the prompt allowing the experimenter to assess comprehension. Nasha was asked a simple question related to the prompt if she did not demonstrate understanding. She expressed frustration with writing and stated that she could not get her thoughts onto paper as she desired. She frequently omitted words, inverted word order, and wrote run-on sentences and fragments.

Nasha’s handwriting was large and easily legible. During Phase I: Baseline, Nasha wrote an average prompt 1 and prompt 2 TWW of 40 words per three-minute session, a score that fell between the 10th and 25th percentile for her grade. Raw data across sessions and dependent measures were variable (see Table 5 and Figure 3). Averaged data per phase and dependent variable (Table 6) indicated a practical improvement in TWW and WSC in Phase II: Self-graphing that was not reflected in a high percentage of non-overlapping data. Although Phase II: Self-graphing did not result in responses that consistently exceeded the TWW of Phase I: Baseline writings, her responses did show an average improvement of approximately 25% that, if maintained over time, might result in longer responses to classroom assignments. On average, quality indicators (CPM, CIWS, and %CS) also showed improvement. Across dependent
measures, PND showed no intervention effects; however, an average increase of 11 words (TWW) across 17 sessions and an increase of 9 correct sequences (CIWS) in a student with language impairment indicates a rate of growth that, if maintained, may have improved educational outcomes.
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Figure 3. Nasha: TWW and %CS Per Session and Phase
Table 3

*Nasha: Mean of all P1 and P2 Data Points per Phase and Dependent Measure with Mean Change Between Prompts, Range within Phase, and Percent Non-overlapping Data*

<table>
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*Participant completed one writing in Phase IV.*
**Group One Results.** An analysis of Group I TWW for first and second writings across subjects (Figure 4) does not demonstrate experimental control across participants for self-graphing. High variability across sessions obscured change; however, two of the three participants in Group I showed an average increase of 11 words (TWW) and an increase of 9 and 11 correct sequences (CIWS) while self-graphing. Across participants CPM was consistent across phase change.
Figure 4. Group One TWW for P1 and P2 Across Phases
Research Question Two

Does repeated writing with self-graphing improve writing fluency in secondary students as measured by TWW, CIWS, WSC, CPM, and %CS?

Tina. On average Tina demonstrated some improvement in TWW and WSC after moving to Phase III: Self-graphing and Repeated Writing (Table 2). Average CPM and CIWS remained the same. Her average %CS fell by three points from the previous phase and nine points from baseline. Thirty-nine percent of TWW and WSC data points were higher than in baseline, a PND indicating a less than small effect; however, Tina did not have any data points over baseline across the other dependent measures in the self-graphing phase.

Julius. On average Julius demonstrated a moderate effect when repeated writing was added to self-graphing as indicated by PND in TWW (75%) and WSC (81%) (Table 2). Average CPM remained consistent with previous phases. On average Julius demonstrated a small average decrease in CIWS (48) of five points below the previous phase (Phase II), but average %CS returned to near baseline level. Experimental control may have been demonstrated in TWW and WSC in Phase III: Self-graphing and Repeated Writing and an increase in quantity corresponded with an increase in average CPM of two points and CIWS of seven points over baseline. Julius’s ratio of correct sequences and total sequences (%CS) was one percentage point lower in Phase III than in baseline.

Nasha. The addition of repeated writing with self-graphing was associated with a small positive effect on TWW (PND=50). Her average WSC also increased by four words over self-graphing and 15 words over baseline. Indicators of quality that had been
stable or increased in the self-graphing phase declined with repeated writing. Nasha’s average CPM decreased by one point, and her average CIWS decreased by five points from scores in Phase Two. Her average total number of CISW was four points higher than in baseline. She also demonstrated an increase in average TWW. However, she demonstrated a decrease in %CS with repeated writing. Experimental control was not established. Nasha’s increase in TWW occurred without a neutral or positive change in quality.

**Research Question Three**

Does repeated writing with self-graphing and feedback improve writing fluency in secondary students as measured by TWW, CIWS, WSC, CPM, and %CS?

**Tina.** On average Tina wrote less words in Phase IV: Self-graphing, Repeated Writing, and Feedback than in any other phase (Table 2). Her change in score was consistent between TWW and WSC. When the component of feedback was added to the intervention, Tina’s average CPM increased from two in all other phases to four in Phase IV. This increase in quality was also seen in CIWS and %CS. Tina’s CIWS increased 13 points over Phase II: Self-graphing and Phase III: Self-graphing and Repeated Writing indicating that feedback was associated with gains in quality indicators. PNDs revealed that Phase IV had a minimal effect on the dependent variables; however, during Phase IV, Tina showed the greatest variability in TWW (range 33-70) and the highest %CS (86%) of the study. In the feedback condition, she also demonstrated the largest average change in CIWS between PI and P2 suggesting that although she was able to use feedback to improve on the quality of her writing, the quantity of her writing decreased.
Although experimental control was not demonstrated, Tina’s average %CS of 86% with feedback may be of practical significance in contrast to her lowest average %CS of 71% in the previous phase.

**Julius.** Julius was the only participant observed to receive feedback and then composed a completely different second response. Although he was observed to correct spellings between first and second writings, he often chose to approach a prompt from a different perspective in second writings minimizing the benefit of feedback from the first prompt. Julius demonstrated some difficulty with sustained attention and appeared to become easily bored. When the component of feedback was added, Julius demonstrated an immediate decline in average TWW of 30 words below previous phase and 14 words below baseline. His spelling improved with feedback and his average WSC with feedback was three points lower than TWW in contrast to a six point difference in baseline. Average CPM was consistent with previous levels. Average CIWS was the lowest across phases including baseline, but the ratio of correct sequences to words written was higher than any other phase. Julius was able to write more after the addition of self-graphing and repeated writing without a negative impact on quality, but that reversed immediately with the addition of feedback. With feedback his writing slowed and his quality indicators became mixed. His spelling and punctuation were better as captured by %CS but he wrote less correct sequences overall.

**Nasha.** Nasha moved unexpectedly from the district after one session in Phase IV: Self-graphing, Repeated Writing, and Feedback, so no conclusions have been drawn from the session for the purpose of answering research question three. It is unfortunate that additional data points could not be collected because Nasha was the only participant
with noticeable language impairment. During the only session that involved feedback, Nasha was very attentive to the experimenter’s reading of her work and interjected several times what she had meant to say. Although her TWW returned to average baseline level (Table 6), she did not misspell any words in her second writing, included five punctuation marks, and increased her CIWS to 17 points over baseline. She had written with such accuracy once during baseline; however, her baseline average %CS (77%) was consistent with her typical performance.

**SpongeBob.** SpongeBob was eager to participate in the study because she stated that she had difficulty writing essays on tests that reflected what she really knew about a subject. Her handwriting was easily read with consistent and correct letter formation and spelling. Raw data per dependent variable (Table 7) and TWW and %CS (Figure 5) reflected that her writings were less varied and she demonstrated higher overall performance than seen in any other participant. During Phase I: Baseline, SpongeBob wrote an average TWW per three-minute session of 74 (Table 8), a score that fell at the 75th percentile for her grade (AIMSweb, 2010). All indicators of quantity and quality were consistent with average TWW. After the implementation of Phase IV: Self-graphing, Repeated Writing and Feedback, there was no noticeable change in any dependent variable. Although the average of dependent variables appeared to have fallen six points during Phase IV, after the two session following her return from a hand injury are removed from the profile (sessions 8 and 9, Table 7), her average TWW for Phase IV was 75 indicating that the change was a function of hand pain. Under time constraints, she was able to write quickly and accurately, therefore, no growth was seen after intervention.
Table 4

*SpongeBob: Raw Data Across Sessions by Dependent Variable for P1 and P2 with Change Score per Session*

|       | Baseline |            | Baseline |            | Baseline |            | Baseline |            | Baseline |            | Baseline |            | Baseline |            | Baseline |            | Baseline |            | Baseline |            | Baseline |            | Baseline |            |
|-------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|
|       | 1        | 2          | 3        | 4          | 5        | 6          | 7        | 8          | 9        | 10         | 11       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| Session |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| TWW1   | 66       | 76         | 71       | 65         | 67       | 80         | 73       | 44         | 56       | 68         | 74       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| TWW2   | 79       | 88         | 78       | 78         | 77       | 67         | 73       | 45         | 69       | 73         | 88       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| Change | 13       | 12         | 7        | 13         | 10       | -13        | 0        | 1          | 13       | 5          | 14       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| CPM1   | 5        | 5          | 5        | 7          | 6        | 5          | 5        | 6          | 2        | 3          | 5        |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| CPM2   | 5        | 4          | 5        | 3          | 7        | 6          | 3        | 6          | 7        | 7          | 7        |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| Change | 0        | 1          | 0        | -4         | 1        | 1          | -2       | 0          | 5        | 4          | 2        |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| WSC1   | 66       | 75         | 70       | 65         | 67       | 79         | 72       | 43         | 55       | 68         | 74       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| WSC2   | 79       | 87         | 78       | 77         | 77       | 66         | 73       | 45         | 68       | 73         | 87       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| Change | 13       | 12         | 8        | 12         | 10       | -13        | 1        | 2          | 13       | 5          | 13       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| CIWS1  | 65       | 70         | 66       | 60         | 74       | 73         | 61       | 44         | 31       | 61         | 67       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| CIWS2  | 76       | 78         | 79       | 75         | 80       | 69         | 71       | 51         | 70       | 75         | 88       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| Change | 11       | 8          | 13       | 15         | 6        | -4         | 10       | 7          | 39       | 14         | 21       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| %CS1   | 96       | 93         | 93       | 92         | 100      | 93         | 89       | 94         | 76       | 93         | 92       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| %CS2   | 91       | 85         | 95       | 91         | 94       | 95         | 93       | 100        | 91       | 94         | 93       |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
| Change | -5       | -8         | 2        | 1          | -6       | 2          | 4        | 6          | 15       | 1          | 1        |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |          |            |
Figure 5. SpongeBob: TWW and %CS Per Session and Phase
Table 5

*SpongeBob: Mean of all P1 and P2 Data Points per Phase and Dependent Measure with Mean Change Between Prompts, Range within Phase, and Percent Non-overlapping Data*

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James. James was observed to write slowly and carefully throughout the study. His handwriting was easily read and he had few misspelled words. Raw data across dependent measures show variability throughout baseline and intervention across measures (Table 9). Total Words Written demonstrated a negative trend leading up to the implementation of Phase IV: Self-graphing, Repeated Writing, and Feedback (Figure 6) and an increase in TWW after the first application of the independent variables; however, that positive change reversed during subsequent sessions, and similar variability was observed during baseline and intervention. The %CS (Figure 6) was consistently high throughout the study indicating that James wrote with a consistent quality no matter how much he wrote.

Averaged data per dependent variable and PND (Table 10) showed a slight average increase across variables, however, not even small intervention effects were evident. Whereas his overall performance was consistent across phases, his average improvement between P1 and P2 writings was greater in Phase IV for CIWS, and this finding was consistent with observed behavior. James was able to remember and apply feedback to his second writing. Experimental control was not demonstrated with James, but he stated that he liked self-graphing and receiving feedback.
Table 6

James: Raw Data Across Sessions by Dependent Variable for P1 and P2 with Change Score per Session

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Figure 6. James: TWI and %CS Per Session and Phase
Table 7

*James: Mean of all P1 and P2 Data Points per Phase and Dependent Measure with Mean Change Between Prompts, Range within Phase, and Percent Non-overlapping Data*

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</tbody>
</table>
Angel. In spite of writing with her non-dominant hand for less than nine months, Angel began the study with an average TWW during baseline of 82 words per three-minutes, a score that fell at the 90th percentile for her grade. Her handwriting was small and difficult to read. Some letters were consistently formed incorrectly; however, words were not counted as misspelled if space and shape were consistent with a correct spelling. Raw data for each dependent measure showed variability across sessions (Table 11). No patterns were evident in the visual inspection of TWW and %CS across sessions or phases (Figure 7). Averaged data per dependent variable, phase and PND (Table 12) indicated little change in all dependent variables with the exception of CPM. On average Angel included three more correct punctuation marks per writing with self-graphing, repeated writing, and feedback. Although her overall CIWS was nearly equivalent between baseline and intervention, she showed the greatest average increase between P1 and P2 during intervention. Experimental control was not established.
Table 8

*Angel: Raw Data Across Sessions by Dependent Variable for P1 and P2 with Change Score per Session*

<table>
<thead>
<tr>
<th>Session</th>
<th>Baseline</th>
<th>SG, RW &amp; FB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1  2  3  4  5  6  7  8  9  10 11 12 13</td>
<td>14 15 16 17 18 19 20</td>
</tr>
<tr>
<td>TWW1</td>
<td>64 63 81 72 77 89 85 71 81 83 82 93 99</td>
<td>99 88 91 53 81 78 77</td>
</tr>
<tr>
<td>TWW2</td>
<td>73 78 76 85 77 91 78 82 86 81 89 86</td>
<td>86 87 91 67 80 70 80</td>
</tr>
<tr>
<td>Change</td>
<td>9 15 -5 13 0 2 -7 11 1 3 -1 -4 -13</td>
<td>-13 -1 0 14 -1 -8 3</td>
</tr>
<tr>
<td>CPM1</td>
<td>6 3 4 4 4 7 5 5 4 3 3 4 4</td>
<td>4 7 6 6 8 5 4</td>
</tr>
<tr>
<td>CPM2</td>
<td>4 4 5 6 4 5 5 7 4 5 3 4 5</td>
<td>7 8 6 9 16 5 4</td>
</tr>
<tr>
<td>Change</td>
<td>-2 1 -1 2 0 -2 0 2 0 2 0 0 1</td>
<td>3 1 0 3 8 0 0</td>
</tr>
<tr>
<td>WSC1</td>
<td>64 62 81 69 75 89 83 68 80 83 82 92 98</td>
<td>98 88 89 53 75 74 71</td>
</tr>
<tr>
<td>WSC2</td>
<td>70 76 73 80 75 87 73 78 79 84 78 87 85</td>
<td>84 84 91 66 80 66 79</td>
</tr>
<tr>
<td>Change</td>
<td>6 14 -8 11 0 -2 -10 10 -1 -1 -4</td>
<td>-5 -13 -14 -4 2 13 5 -8 8</td>
</tr>
<tr>
<td>CIWS1</td>
<td>66 55 75 56 59 73 70 57 81 68 81 91 81</td>
<td>89 89 84 40 59 55 47</td>
</tr>
<tr>
<td>CIWS2</td>
<td>55 72 61 69 67 76 53 63 47 79 60 67 71</td>
<td>79 83 91 60 96 43 70</td>
</tr>
<tr>
<td>Change</td>
<td>-11 17 -14 13 8 3 -17 6 -34 11 -21</td>
<td>-24 -10 -10 -6 7 20 37 -8 23</td>
</tr>
<tr>
<td>%CS1</td>
<td>97 91 94 87 86 88 89 88 98 90 98 97 89</td>
<td>93 97 93 83 83 83 79</td>
</tr>
<tr>
<td>%CS2</td>
<td>86 93 88 88 91 90 82 85 78 93 86 86 89</td>
<td>92 94 97 91 100 79 92</td>
</tr>
<tr>
<td>Change</td>
<td>-11 2 -6 1 5 2 -7 -3 -20 3 -12</td>
<td>-11 0 -1 -3 4 8 17 -4 13</td>
</tr>
</tbody>
</table>
Figure 7. Angel: TWW and %CS Per Session and Phase
Table 9

*Angel: Mean of all P1 and P2 Data Points per Phase and Dependent Measure with Mean Change Between Prompts, Range within Phase, and Percent Non-overlapping Data*

<table>
<thead>
<tr>
<th></th>
<th>TWW</th>
<th>WSC</th>
<th>CPM</th>
<th>CIWS</th>
<th>%CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase I: Baseline</td>
<td>82</td>
<td>80</td>
<td>4</td>
<td>68</td>
<td>90</td>
</tr>
<tr>
<td>Change P1 to P2</td>
<td>+1</td>
<td>-1</td>
<td>+1</td>
<td>-7</td>
<td>-5</td>
</tr>
<tr>
<td>Range</td>
<td>63-99</td>
<td>62-98</td>
<td>3-7</td>
<td>47-91</td>
<td>78-98</td>
</tr>
<tr>
<td>Phase IV: SG, RW &amp; FB</td>
<td>79</td>
<td>77</td>
<td>7</td>
<td>69</td>
<td>89</td>
</tr>
<tr>
<td>Change P1 to P2</td>
<td>+2</td>
<td>+4</td>
<td>+2</td>
<td>+13</td>
<td>+6</td>
</tr>
<tr>
<td>Range</td>
<td>53-91</td>
<td>53-91</td>
<td>4-16</td>
<td>40-96</td>
<td>79-100</td>
</tr>
<tr>
<td>PND</td>
<td>0</td>
<td>0</td>
<td>31</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>
Juggaletta. Juggaletta presented as a very disengaged student. She was willing to participate once in the reference room but appeared to avoid the experimenter whenever possible. Her handwriting was large and immature with spaces in the middle of words and variable spacing between words. Her spelling was poor, and misspelled words were often not even close representations of the intended words. Raw data for each dependent measure show high variability across phases (Table 13). A visual inspection of TWW and %CS (Figure 8) shows a noticeable change in quantity and quality after the application of Phase IV: Self-graphing, Repeated Writing and Feedback with TWW decreasing and %CS increasing.

Averaged data across dependent variables and phases (Table 14) demonstrated an average decline in TWW of 11 words in Phase IV with an improvement in spelling from an average of five misspelled words to two misspelled words per writing. Juggaletta’s average TWW during Phase I: Baseline was 50 words, a score that fell between the 25th and 50th percentiles for her grade (AIMSweb, 2010); however, within those 50 words, she included, on average, 1 correct punctuation mark. On average 64% of her writing sequences were correct. During Phase IV, on average, Juggaletta wrote 39 words per three minutes with three correct punctuation marks and with 84% correct sequences. She also demonstrated the largest average improvement in CIWS and %CS between P1 and P2 writing during intervention. Experimental control as defined for the study was not achieved; however, with self-graphing, repeated writing and feedback, Juggaletta more than doubled her average CIWS and increased her average ratio of CPM from 1:50 to 3:39, a change that is likely to have practical significance if maintained in her academic work.
**Table 10**

*Juggaleta: Raw Data Across Sessions by Dependent Variable for P1 and P2 with Change Score per Session*

| Session | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| TW1     | 37  | 44  | 46  | 49  | 50  | 61  | 65  | 44  | 57  | 52  | 31  | 34  | 54  | 47  | 54  | 53  | 45  | 37  | 38  | 40  |
| TW2     | 52  | 54  | 60  | 47  | 47  | 63  | 57  | 39  | 52  | 46  | 53  | 60  | 49  | 39  | 48  | 61  | 45  | 42  | 40  | 32  |
| Change  | 17  | 10  | 14  | -2  | -3  | 2   | -8  | -5  | -5  | -6  | 22  | 26  | -5  | -8  | -6  | 8   | 0   | 5   | 2   | -8  |
| CPM1    | 4   | 3   | 1   | 0   | 1   | 1   | 1   | 2   | 0   | 3   | 1   | 2   | 1   | 0   | 1   | 1   | 2   | 3   | 2   | 3   |
| CPM2    | 1   | 1   | 1   | 2   | 0   | 1   | 0   | 0   | 0   | 1   | 1   | 0   | 1   | 1   | 0   | 0   | 4   | 3   | 3   | 2   |
| Change  | -3  | -2  | 0   | 2   | -1  | 0   | -1  | -2  | 0   | -2  | 0   | -2  | 0   | 1   | -1  | -1  | 2   | 0   | 1   | -1  |
| WSC1    | 35  | 42  | 41  | 47  | 38  | 59  | 56  | 37  | 57  | 47  | 27  | 31  | 47  | 47  | 49  | 46  | 43  | 33  | 38  | 35  |
| WSC2    | 46  | 49  | 56  | 39  | 42  | 57  | 52  | 33  | 47  | 40  | 52  | 53  | 41  | 38  | 45  | 57  | 44  | 41  | 40  | 31  |
| Change  | 11  | 15  | -8  | 4   | -2  | -4  | -4  | -10 | -1  | -7  | 25  | 22  | -6  | -9  | -4  | 11  | 1   | 8   | 2   | -4  |
| CIWS1   | 18  | 27  | 23  | 19  | 11  | 38  | 0   | 8   | 15  | 21  | 6   | 2   | -1  | 18  | 2   | 2   | 10  | 17  | 37  | 19  |
| CIWS2   | 13  | 22  | 31  | 5   | 14  | 7   | 7   | 11  | 19  | 31  | 12  | 7   | 20  | 19  | 11  | 35  | 35  | 36  | 23  |
| Change  | -5  | -5  | 8   | -14 | -7  | -20 | 7   | -1  | -4  | -2  | 25  | 10  | 8   | 2   | 17  | 9   | 25  | 18  | 1   | 4   |
| %CS1    | 71  | 79  | 75  | 69  | 61  | 81  | 50  | 59  | 63  | 70  | 59  | 53  | 49  | 69  | 52  | 52  | 60  | 71  | 95  | 72  |
| %CS2    | 63  | 70  | 75  | 55  | 54  | 61  | 56  | 59  | 61  | 70  | 78  | 60  | 57  | 74  | 70  | 59  | 86  | 89  | 89  | 83  |
| Change  | -8  | -9  | 0   | -14 | -7  | -20 | 6   | 0   | -2  | 0   | 19  | 7   | 8   | 5   | 18  | 7   | 26  | 18  | -6  | 11  |
Figure 8. Juggaletta: TWW and %CS Per Session and Phase
Table 11

*Juggaletta: Mean of all P1 and P2 Data Points per Phase and Dependent Measure with Mean Change Between Prompts, Range within Phase, and Percent Non-overlapping Data*

<table>
<thead>
<tr>
<th></th>
<th>TWW</th>
<th>WSC</th>
<th>CPM</th>
<th>CIWS</th>
<th>%CS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase I:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>50</td>
<td>45</td>
<td>1</td>
<td>14</td>
<td>64</td>
</tr>
<tr>
<td>Change P1 to P2</td>
<td>+4</td>
<td>+3</td>
<td>0</td>
<td>+2</td>
<td>-1</td>
</tr>
<tr>
<td>Range</td>
<td>31-65</td>
<td>27-59</td>
<td>0-4</td>
<td>-1-38</td>
<td>49-81</td>
</tr>
<tr>
<td><strong>Phase IV:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SG, RW &amp; FB</td>
<td>39</td>
<td>37</td>
<td>3</td>
<td>29</td>
<td>84</td>
</tr>
<tr>
<td>Change P1 to P2</td>
<td>+2</td>
<td>+4</td>
<td>0</td>
<td>+8</td>
<td>+8</td>
</tr>
<tr>
<td>Range</td>
<td>32-45</td>
<td>31-44</td>
<td>2-4</td>
<td>17-37</td>
<td>71-95</td>
</tr>
<tr>
<td>PND</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>71</td>
</tr>
</tbody>
</table>
Groups One and Two. For Group One TWW in prompt 1 and prompt 2 (Table 4) (Tina and Julius) experimental control was not demonstrated as reflected in increase in writing quantity without a decrease in writing quality (Figure 1 and Figure 2), in fact, the opposite effect was evident. For Group Two students, TWW in prompt 1 and prompt 2 (Figure 9) showed little average change in Phase IV with the exception of Juggaletta who demonstrated a similar trade off between quantity and quality (Figure 8) as observed in Tina and Julius in Group One.
Figure 9. Group Two TWW for P1 and P2 Across Phase
Research Question Number Four

Does repeated writing with self-graphing and self-graphing with corrective feedback result in written products scored to be superior to baseline written products?

Three educators holistically scored the last initial writing from Phase I: Baseline and a randomly selected initial writing from Phase IV: SG, RW &FB. The evaluators included an 8th grade English teacher, a 9th grade English teacher, and a retired school administrator with training and experience scoring writing samples for the Writing OAT, referred to as Evaluator One, Evaluator Two, and Evaluator Three, respectively. Evaluators were not affiliated with the participating school district. Evaluators were given paired writings without session numbers or other identifying information. Writings were paired in random order with some second writings on top and vice versa. Of seven paired writings, Evaluator One selected four Phase IV writings as superior to Phase I writings; Evaluator Two selected four Phase IV writings to be superior to Phase I writings; Evaluator three selected four Phase IV writings to be superior to Phase I writings. Across evaluators 57% of writings written under Phase IV conditions were determined to be of superior quality to samples written under Phase I conditions. Across evaluators five Phase One writings and nine Phase IV writings were also deemed to be of sufficient quality to pass the Writing OGT. No response patterns were observed such as scoring all back pages as superior or limiting OGT stickers to writing also designated to be superior.
Research Question Number Five

Does repeated writing with self-graphing and corrective feedback result in a second written product scored to be superior to an initial written product? As described above, Evaluators were also asked to holistically score the first and second writing from sessions 1-3 of Phase IV with the largest discrepancy between CWS. Samples were also cleared of any identifying information and paired with randomly alternating writings on top. There was only one available Phase IV writing for Nasha. On the seven paired writings, Evaluator One selected two P2 writings to be superior to P1 writings; Evaluator Two selected five P2 writings to be superior to P1 writings; Evaluator Three selected three P2 writings to be superior to P1 writings. Across evaluators 48% of second writings written under Phase IV conditions were determined to be of superior quality to first writings. Four first writings and ten second writings were also deemed to be of sufficient quality to pass the Writing OGT. Again, no response patterns were detected.

Research Question Number Six

Do participants, parents and teachers affirm that the intervention was acceptable and useful as measured by individual written survey?

Participants. Seven participants completed a Student Questionnaire (see Appendix N). Three questions assessed student perceptions of acceptability. These questions and student responses are quoted or summarized below:

What did you like about participating in the writing activity?

- It thought me how to write more in a short time.
- I like all of the sessions they were fun and helpful
- I got better at writing a lot more then I used to.
I liked how she explained a lot instead of just letting me go write wrong.

I liked getting feedback about my writing, feedback, and how I can make my papers make more sense.

The chance to write creatively and get feedback

Learning how to write more about a subject and learning to write more neatly

What did you dislike about participating in the writing activity?

- Nothing really bothered me
- Nothing really everything was great it helps a lot
- Rewriting to the same prompt
- Not being able to write for longer
- The amount I had to write in a short amount of time. It made my hand hurt.
- Leaving class
- Nothing

Would you participate in this writing activity again?

Five participants indicated that they would participate in the writing activity again and two participants indicated ambivalence, “Maybe, I guess I would.” and “It doesn’t really matter to me either way.”

Four questions assessed student perceptions of utility. These questions and student responses are quoted below:

Which activity (graphing, rewriting, getting feedback) helped the most with your writing?

- All of because I could see my progress in different ways.
- Feedback and graphing
- Graphing
• Graphing helped me most
• The feedback helped me out the most
• Getting feedback, I realized where my mistakes were
• Getting feedback

*Did participating in this writing activity help your other schoolwork? If yes, how?*

• It helped me in all my subjects on writing portions on test.
• Yes, I’m infused to write my papers now
• It helped me with the writing part of the OGT I passed
• Somewhat with some English activities because I got to put down a lot for assignments
• No, not really
• I didn’t notice
• Yes in English because when were ask to write about something I would write more than I use to

*Did participating in this writing activity help you feel more prepared for the Writing Ohio Graduation Test?*

Four participants affirmed that it was helpful. Three participants’ responses were either neutral or indicated that they had already passed.

*Will you continue to use any of the activities to help you prepare for the Writing Ohio Graduation Test?*

Three participants affirmed that they would continue to use activities to prepare for the Writing OGT. One participant indicated the use of “all of them,” but others either did not respond to the question or stated that they had already passed.
Three students provided additional comments including:

- I had a great time it helped me gain confidence to write more
- I loved this for many reasons and it will help me in the future
- Good teacher, I was able to stay focused. She was really nice.

**Parents.** Four parents returned a Parent Questionnaire (see Appendix O). Parents were asked what they liked and disliked about their child participating in the study, what their child said about participation at home, and if they saw any improvements in their writing during the intervention. Four parents indicated that there was nothing that they disliked about their child’s participation. One parent indicated that he or she had no idea if there had been any improvement; however, three parents affirmed improvement indicating that they had noticed more thought being put into writing, more awareness of methods to improve writing, and writing that was more expansive.

The four parents who returned the questionnaire reported that they liked the one-on-one help, the consistent, reliable help in an area of weakness, that their child was able to learn what he was missing and taught easy ways to improve his writing, and that the intervention was needed. Parents reported that their children expressed positive feelings at home about participation in the study stating:

- He had a better understanding of his weaknesses.
- She liked the class a lot. She felt it helped her to become a better writer.
- He felt that it helped him and taught him how to be a stronger writer.
- She really enjoyed it and learned a lot.
Teachers. Six teachers returned a Teacher Questionnaire (see Appendix P). Not all responses have been reported due to either failure to respond or responses that were ambivalent or tangential to the question. Three questions assessed teachers’ perceptions of treatment acceptability: Were there any negative consequences for the students as a result of participating in the study?, Upon examination of the intervention scripts, were there any instructional methods that you are likely to use in the classroom?, and What methods do you think students would find enjoyable?

One teacher reported the negative consequence that in missing part of his or her intervention period, the participant had difficulty catching up with assignments. No other negative consequence was reported. One teacher reported that he or she found all the instructional methods to be appealing. Three teachers indicated that they were likely to use repeated writing with feedback, and one teacher indicated the same for self-graphing. One teacher indicated that students were likely to enjoy feedback on a topic sentence, and four teachers indicated the same for self-graphing, stating that the practice gives strong visual feedback that allows students to see their progress.

Three questions assessed teachers’ perceptions of treatment efficacy: Did you notice any difference in the student’s writing performance while s/he was participating in the study?, Did the writing intervention appear to be valid and appropriate for increasing writing fluency in secondary students?, and Do you feel the intervention will help prepare students for the Writing Ohio Graduation Test?

Four teachers indicated that they did not see any difference in the student’s writing during the study. One teacher affirmed that his or her student was better able to focus and wrote more without improvement in sentence structure, and another that the
student completed more work. Four teachers affirmed that the intervention appeared to be valid and appropriate for improving writing fluency and two indicated ambivalence. Five teachers affirmed that the intervention might help students prepare for the Writing OGT, but one teacher indicated that it was unnecessary because students with IEPs are allowed extra time for writing and might find writing under timed conditions to be stressful. One teacher provided a suggestion for improving the intervention indicating that one minute of “think time” was probably not enough.
Chapter Five: Discussion

This chapter provides a summary of findings and a discussion of implications for current practice and future study. In addition, a model for utilizing components of this study in the differential diagnosis of a Specific Learning Disability in Written Expression is proposed including a hypothetical conclusion, IEP goal, and educational intervention.

Summary of Study and Findings

A multiple baseline across participants was completed with two groups of high school students with disabilities. Both groups completed a baseline in which they wrote for five minutes in response to a prompt and then wrote again for five minutes to another prompt. Group One then added self-graphing (SG), self-graphing with repeated writing (RW), and self-graphing with repeated writing and feedback (FB). The second group moved directly from baseline to the full intervention (SG, RW, and FB). An increase in writing fluency was defined as an increase in quantity without a concomitant decrease in quality as measured by Total Words Written (TWW), Words Spelled Correctly (WSC), Correct Punctuation Marks (CPM), Correct Minus Incorrect Writing Sequences (CIWS), and Percent of Correct Sequences (%CS).

Indicators of reliability of measurement, fidelity of implementation, and social validity were positive; however, variability across phases and dependent measures prevented clear evidence of experimental control. High variability across even extended periods of baseline was attributed to participant and prompt interaction. Participant
feedback about the intervention was positive. Student comments were consistent with behavior observed during the study. Participants reported that they found the overall intervention, as well as the components self-graphing and feedback, to be acceptable and useful. Parents and teachers who responded to the questionnaire also reported positive indicators of social validity.

Intervention results were neutral for three of four participants in Group Two who showed minimal average change across dependent measures. One participant in Group Two showed a decrease in quantity and an increase in quality after moving into intervention. With SG, RW, and FB, this participant increased her use of correct punctuation from an average of 1 per 50 words to 3 per 39 words and improved %CS from 64% to 84%. This trade off between quantity and quality was also observed in two of the three participants in Group One. One participant in Group One could only be evaluated for SG and SG with RW due to mortality. In Group One, two of three participants increased average quantity and quality with self-graphing of TWW, and one participant maintained an average level of TWW with a decrease in quality. When repeated writing was added to self-graphing, all participants in Group One showed at least a small increase in average TWW; however, that increase corresponded with a decrease in average %CS to below baseline levels. In moving from SG to SG and RW, all students either decreased or maintained the same average level of CIWS.

When feedback was added to SG and RW, both participants remaining in Group One demonstrated a -30 and -8 point change in average TWW from the previous phase (Phase III) and a -14 and -6 point change in average TWW from baseline. This negative change in quantity corresponded with a +7 and +15 point change in average %CS over
previous phase (Phase III) and a +6 and +6 point change in average %CS from baseline. One student in Group Two met both criteria for increased writing fluency, but his average gain in TWW was 1 point, and his average increase in indicators of quality were small: +1 CPM, +4 CIWS; +2 %CS. For most participants feedback (isolated in Group One and as a component in Group Two) was associated with increased quality.

**Instructional Effectiveness**

Blind holistic scoring yielded results comparable with that of chance suggesting that little, if any, qualitative change was evident over time and after feedback. Of the fourteen paired writings, all evaluators agreed on a total of three pairs. On two pairs, all agreed that the latter writing was superior and on one pair, all agreed that the earlier writing was superior. This very low rate of agreement across evaluators (approximately 20%) is consistent with the evaluation of a complex creative work. Each evaluator was qualified and experienced in the instruction and evaluation of written work, but brought, as a reader, a unique set of expectations.

Evidence of efficacy was observed in two students with self-graphing. Two participants demonstrated a trade off between quantity and quality with the introduction of feedback, and one participant demonstrated the same with introduction of the full writing intervention. Ideally, in a classroom these students would have continued in Phase IV receiving feedback until TWW returned to highest previous levels with consistently high indicators of quality. When such an inversion of scores is observed with the addition of feedback in a student who has previously demonstrated an average TWW, then it is reasonable to assume that there is a lack of fluency in the application of more complex rules of written expression. Whereas a younger student may demonstrate
a lack of fluency in mechanical or transcription aspects of writing, older students who have demonstrated an ability to write quickly may write less when they self-monitor TWW and write even fewer words after they receive feedback. Plausible reasons for a reduction in the number of words that are written may be that students have to apply much cognitive effort when they begin to self-monitor and apply rules that are new to them. Identifying a trade off between quantity and quality may be useful in identifying students in need of practice and fluency building of higher order writing conventions.

Both Kasper-Ferguson and Moxley (2002) and Stotz, Itoi, Konrad and Alber-Morgan (2008) studied self-graphing of freewriting in 4th grade students with and without disabilities. Both found self-graphing of TWW to be associated with improvement in quantity and quality of writing, but Kasper-Ferguson and Moxley (2002) discussed the possibility of ceiling effects due to physical limitations. The authors did not observe ceiling effects in their population; students continued to increase TWW across the school year without reaching a plateau.

Ceiling effects may have been observed in several participants in this study who observed their graphed data, commented that they wanted to beat their highest score, and then expressed disappointment when they did not. When graphed data of TWW was compared with similar graphed data from the previously mentioned studies, two differences were visually apparent. Participants in the current study demonstrated greater relative variability of TWW than younger participants and there were signs that across phases several study participants were writing as quickly as they physically could.
The positive outcomes reported with repeated writing in 5th and 6th grade students (Bauernschmidt, 1991) and with 7th to 12th grade students (Harriman & Gajar, 1986) were not clearly replicated in this study. Harriman and Gajar found benefits across conditions that included repeated writing; however, the study included five sessions and the pretest-posttest design did not allow for a comparison of variability across and within participant data. Variability across and within the three subjects studied by Bauernschmidt (1991) was much lower than that observed in the current study. Due to variability across dependent measures and differences in age and design of studies, it is difficult to establish consistencies or inconsistencies between the current study and earlier studies of repeated writing. By using multiple dependent measures across 11-28 sessions, this study captured the difficulty of assessing change in high school writers and the complexity of change across phases.

Implications for Practice

Self-graphing. Participants reacted positively to self-graphing both behaviorally during the study and in written response on the participant questionnaire. Julius began with a TWW score that fell above the 50th percentile for his grade. Although Julius had been diagnosed with ADHD, he presented as a typical high school student. Given the simplicity of the intervention and Julius’ positive average change in TWW and CIWS, self-graphing may be an easy intervention to motivate high functioning students. Of the three students who were presented with self-graphing in isolation, Nasha was the only student who began with a low TWW, an average of about 13 words per minute and increased her TWW by about 28% during self-graphing. Her average %CS increased from 77% to 80% with self-graphing. Self-graphing of TWW was a fast and easy
intervention to implement. However, if ceiling effects with TWW are evident in high school students, an alternative metric such as CWS may allow for visually observable growth, the positive reinforcement of surpassing previous scores, and similar increases over time observed in younger students by Kasper-Ferguson and Moxley (2002).

**Selection of CBM and High School Writers.** The scoring and analysis of multiple dependent variables was too time consuming to be useful for a high school teacher monitoring the writing progress of multiple students. No single CBM emerged across all participants as the single best metric for interpreting quality and quantity. The comparison of TWW and WSC provided an indication of spelling ability. When graphed side by side, the profile of the two measures was parallel over time. The overall difference between TWW and WSC quickly established a student’s need for spelling feedback and intervention. Correct Punctuation Marks provided a similar measure for assessing complexity of writing and completeness of sentences. Both WSC and CPM provided useful information about student writing and may be useful in identifying general writing goals. Within subjects TWW and WSC appeared to be equivalent indicators of quantity. Change in CPM was too small and too variable to be useful as a singular metric. In the presence of CIWS, the experimenter’s perception was that the information provided by WSC and CPM was redundant; however, CIWS was the most time consuming metric to collect.

For classroom teachers, the ideal curriculum-based measures may be a function of time, student abilities, and student needs. Because high school students with high incidence disabilities are generally able to count and graph TWW, it may be the most efficient measure for monitoring change in quantity. In terms of teacher time and student
benefit, the ideal CBM for assessing quality may be to score CWS with a student during a student/teacher conference so that feedback can be provided with the student maintaining the responsibility of self-graphing both an indicator of quality and quantity. Over time, high school students may be able to understand and monitor CWS as easily as TWW and together maintain a portfolio that documents two interrelated components of fluency: quantity and quality. Because high school students typically have years of experience interpreting percentages in the form of grades on assignments, converting CWS to a percentage (%CS) may be more effective than CWS in communicating overall quality to students and for informing student selected goals. High school students may be behaviorally primed to understand positive or negative change in quality graphed as a percentage.

**Limitations**

The inability to control the interaction of the prompt and student knowledge/motivation is a limitation of any study of written expression. Whereas this study lends some support to the practice of self-graphing of TWW and providing feedback on quality with high school students, the number of participants was small (n=7) and the experimenter had difficulty accessing older students with the poorest writing scores. Because participants were required to have either a study hall or intervention period, the experimenter was not able to access students who had previously failed classes, were in credit recovery, and could not logistically take intervention classes or carve out a time during their day in which to work with the experimenter. The result of implementation of components or the full intervention may be entirely different if implemented in a regular
classroom with poor writers. In addition, the grade norms for TWW cited in this study were taken from a small, self-selected sample of high school students as reported by AIMSweb and percentile ranks should be interpreted with caution.

**Directions for Future Research**

The interaction of the prompt and student knowledge/motivation is difficult to control in research on written expression. Although prompts were judged to be equivalent by English teachers, and no prompts emerged as universally rejected or poor, every participant reacted occasionally to the reading of the prompt by either verbally or non-verbally indicating that they didn’t really like it. Several students indicated they did not like the prompt and then wrote more than they had written the previous day indicating that they could still fluently compose a response. However, during other sessions, after counting and graphing their words, they qualified their poor performance by stating that they just did not have anything to say on the subject. This interaction will undoubtedly influence variability when students are provided pre-written prompts. Future studies may reduce prompt influence by allowing students to write on a topic of their choosing, by providing several prompts and allowing students to select one, or by asking students to write for a short period of time on several topics before selecting a prompt to fully develop.

The method of prompt selection/assignment used in this study closely resembled the writing demands of standardized and classroom testing and many classroom assignments in which the student is given a topic. However, for the purpose of experimentally measuring fluency, anything that reduces the variability influenced by prompt/student interaction may be advisable. The ultimate goal of building writing
fluency is to develop skills that can be applied to any prompt, but for research purposes, it would be very beneficial if future research identified methods for creating or selecting prompts that minimized prompt and knowledge/motivation interactions.

Prior to the first session with the evaluator, students knew that they were participating in a writing study, and the situational variables were inconsistent with typical writing conditions for that school. Phase I provided a baseline for reference as task demands changed throughout phases, but the variability seen in Phase I may not have been seen in a school that utilized direct instruction, daily writing and frequent CBM. Variability may have been reduced if students were accustomed to regular writing sessions, and future researchers may achieve different results in a different school.

Previous studies of repeated writing utilized the same prompt across a span of days. This study implemented repeated writing with students writing to the same prompt during the same session. Repeated Reading involves more than two readings of the same passage. Whereas the combined intervention did not increase writing fluency in this sample of high school students, the study represented a new combined intervention with an older population. The results could be explained by several factors. Repeated Reading is effective with students who have basic reading skills and are working on fluency (Fuchs, Fuchs, & Hosp, 2001). Most of the students referred and selected for this study began with a TWW at or above the average range for their grade. They may have been developmentally at a place where quantity was no longer a significant limiting factor while writing. Future research should further explore repeated writing with high school students who have developed basic writing skills but need to build fluency.
Several validated aspects of Repeated Reading were not closely paralleled in this study. Participants received feedback on quantity in the form of self-graphed TWW and feedback on quality as the researcher read their writing aloud and informed them of mistakes. Students often caught their own mistakes as the researcher read their first writing aloud and indicated that they had meant to write something differently. The repeated writing intervention did not require students to re-write more than once, and although participants were asked to write more than they wrote before and incorporate feedback into their second writing, they did not continue to write until meeting either a quantitative or qualitative benchmark. Future studies should examine the practice of repeated writing to the same prompt until reaching a predetermined benchmark. Once students have demonstrated an ability to produce TWW scores in the average range for their grade, they may benefit from marking correct and incorrect writing sequences, creating a strategy guide with their frequent errors, practicing to build fluency in rule application, and then self-monitoring subsequent writings using the strategy guide.

Studies of Repeated Reading have concluded that different goals require different implementation protocols. With Repeated Reading, participants are able to read the same word repeatedly after feedback. With repeated writing, students generate sentences in response to the same prompt, but even with feedback, students may write to the same prompt without creating a similar sentence that incorporates feedback. Whereas most students in this study wrote a second essay in Phase III and/or IV, one participant often wrote a second essay that bore little resemblance to his first essay. Repeated writing without formative feedback risks further engraining habitual errors, but with formative feedback, it creates an opportunity to reduce the cognitive demands of creating text while
building fluency in other cognitive aspects of writing such as rule application. Future studies may find repeated writing to be an important component of interventions to build fluency in the application of writing behaviors related to quality.

Research in written expression with secondary students would benefit from the identification of developmental stages and corresponding sub-groups of writers. For example, “adolescent writers” should be more narrowly defined than 4th-12th grade students. Perhaps writers should be grouped into late elementary (grades 4 and 5), adolescent (grades 6-8), and late adolescent (grades 9-14). In addition to more narrowly and clearly defining age groups, future research should establish norms for aspects of writing construction and writing transcription. It is likely that most students reach a ceiling in transcription fluency, but the construction demands of writing are more dynamic and abstract over time. For example, the word “because” is formed the same way every time it is transcribed, but the same word can be incorporated into an infinite number of different sentences. When studying fluency in high school writers, are researchers more likely to be studying a lack of fluency in construction versus a lack of fluency in transcription?

**Diagnosis of a Learning Disability in Written Expression**

Although the results of this study across participants were inconsistent, the process allowed the experimenter to gain specific insight into the writing difficulties of participants. It is possible that aspects of this intervention may be useful in the differential diagnosis of a specific learning disability in written expression. Several of the participants in this study had an IEP goal in writing that included the ability to write a three paragraph essay with a beginning, middle, and end with fewer than a certain
number of errors. Using a CBM and the following protocol, it might be possible to
develop a less subjective goal that could be measured in such a way as to document
incremental change and monitor progress. The following steps might facilitate an
accurate diagnosis and clearly articulated goals:

1. Using an expository prompt and one minute think time, measure fluency of
dictation as total words spoken in three minutes noting long pauses or
grammatical errors for several sessions.

2. Using the same prompts and a three minute writing, measure TWW, WSC, and
CPM to assess spelling quality, sentence complexity and differences in quality
and quantity of dictated versus written responses.

3. Using different prompts, measure TWW of three minute writings with self-
graphing until data stabilize indicating the student’s highest possible rate of
transcription.
   • If quantity and quality improve with self-graphing, writing difficulty in
classroom may be the result of poor motivation.
   • If quantity improves and quality declines, writing difficulty may be the result
of limitations in construction.
   • If TWW, WSC, and CPM remain stable or both quality and quantity decline,
the student may be writing as quickly as he or she can and may be
demonstrating difficulty with fluency in transcription and/or construction.

4. Contrast results of self-graphing of TWW, fluency of dictation, and results from a
standardized measure of visual perception and motor coordination.
5. As in Phase IV, have student write, read aloud, provide feedback, and then write again for several sessions to determine if student is able to understand, retain, and utilize feedback.

6. Using error analysis of previous writings, teach skills, used guided practice and independent practice until student demonstrates mastery.

7. Write again for several sessions with error analysis.
   - If the same errors are present, the student failed to respond to intervention.
   - If student retained instruction and demonstrates growth in indicators of quality, he or she has shown a positive response to intervention.

Although the described proposed process would require experimental testing to establish validity and an explicit protocol to promote reliability across evaluators, it may be a diagnostic process that yields superior reliability to current diagnostic protocols that base diagnosis on a relatively small sample of student writings. The conclusions from such a process may resemble the following:

James demonstrates difficulty with writing fluency even when motivated to write that cannot be explained by deficits in visual/motor integration or fine motor skills.

James demonstrates fluency of construction with dictation that is inconsistent with written construction. After demonstrating mastery of specific conventions of writing in isolation, he continues to inconsistently apply knowledge while writing and his post-intervention rate of writing falls at the 10th percentile for his grade.
If diagnostic parameters are communicated in terms of CBM, IEP goals may be easily generated and instructional interventions developed to target a more finitely defined deficit. An appropriate IEP goal for James may be to increase his fluency of written construction as measured by CWS by 40%.

Assuming that James is receiving instruction in a collaborative English classroom as well as an English Assist period and that other students have a similar goal, his instructional intervention to meet this goal may be a class wide instructional intervention designed to build automaticity of rule application during construction of sentences. The following is an untested academic intervention conceived to target such a writing goal.

James and his classmates would receive explicit instruction in twenty rules of punctuation, guided practice, and teacher-generated examples of sentences with correct application of each rule. Students would then become accountable for their own learning by self-monitoring their weekly results to a quiz of alternating forms:

- Ten correct sentences. Students provide the rule applied to each.
- Ten incorrect sentences. Students correct the sentences and identify the rule applied.
- Ten rules. Students generate a correct sentence.

All students would take a weekly test until they test out by earning two consecutive scores >90% after which they would be allowed a free choice silent reading each week until everyone had demonstrated mastery. Students would self-monitor performance on tests by charting rules missed that week. The intervention specialist could provide further instruction and practice as needed to all students during the regular class period and individualized instruction and additional practice for James during his Assist period while
also monitoring his progress. The special education teacher would be able to determine if explicit instruction in complex rules of punctuation and practice creating and recognizing sentences that apply the rules improved fluency of retrieval and application as measured by CWS for James, but would also gain useful information about all the students in the class. If most students tested out quickly, then they did not need additional instruction or practice. The classroom teacher can be confident in holding students accountable for these errors in their writing. If many students needed weeks of additional practice, then the intervention would have been beneficial for all.
References


Jacobellis V. Ohio, 378 U.S. 184.


Appendix A: Parental Consent Form
The Ohio State University Parental Permission
For Child’s Participation in Research

Study Title: The Effects of Repeated Writing on Secondary Students’ Writing Fluency
Researcher: Ms. Carisa Taylor, Dr. Laurice Joseph, Dr. Moira Konrad, and Dr. Terri Hessler
Sponsor: None

This is a parental permission form for research participation. It contains important information about this study and what to expect if you permit your child to participate. Your child’s participation is voluntary. Please consider the information carefully. Feel free to discuss the study with your friends and family and to ask questions before making your decision whether or not to permit your child to participate. If you permit your child to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose: The purpose of this study is to determine if students are able to write more fluently after responding repeatedly in writing to the same or similar writing prompts.

Procedures/Tasks: Students who would like to participate in the study and whose parent(s) consent will provide two to three writing samples per week until writing intervention begins. During intervention, students will continue to provide writing samples, but they will also receive feedback on the quantity and quality of their writing and write again on the same topic to incorporate feedback and build fluency in response. The writing intervention and data collection will be conducted by a former English teacher with experience instructing high school students with reading and writing difficulties.

Duration: The study will take place during the first semester of school. It will begin in October and end in January. Students will participate in approximately thirty sessions that last approximately 15-30 minutes each. The decision to participate will not affect your relationship with your school, your teachers, or The Ohio State University.

Your child may leave the study at any time. If you or your child decides to stop participation in the study, there will be no penalty and neither you nor your child will lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.
Risks and Benefits: This study poses minimal risk to students as they will be engaging in writing assignments that are typical across grade level and academic subjects. Participants may lose study hall time that results in having to do some homework at home.

There are several benefits for participants in the study. Participants will receive individual instruction and practice writing, and their growth will be monitored. Students will be taught how to evaluate and improve their own writing, skills that may be beneficial in their coursework and on future attempts to pass the OGT. In addition to improved skill, students may feel more confident when asked to write.

Confidentiality:

Efforts will be made to keep your child’s study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your child’s participation in this study may be disclosed if required by state law. Also, your child’s records may be reviewed by the following groups (as applicable to the research):
Office for Human Research Protections or other federal, state, or international regulatory agencies;
The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

Student data will be recorded under an assumed name; however, individual sessions may be observed by employees of the school district or by individuals affiliated with the Ohio State University College of Education and Human Ecology.

Incentives: Students will not be paid to participate in this study.

In addition to providing parental consent for your child's participation, you are being asked to participate in the research study by completing and returning a questionnaire at the end of the study. A questionnaire and stamped envelope will be mailed to you at the end of the study. If you choose to participate in the study, please return the completed questionnaire in the envelope to the researcher. Your participation is entirely voluntary. Your choice to not return the completed questionnaire will have no consequences for you or your child; however, your feedback will help the researchers further develop effective educational interventions. Your responses will be confidential and they will not be shared with your child or their teachers. You are entitled to the same rights and protections as a research participant as those herein described.
Participant Rights:

You or your child may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you or your child is a student or employee at Ohio State, your decision will not affect your grades or employment status.

If you and your child choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights your child may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

Contacts and Questions:
For questions, concerns, or complaints about the study you may contact Carisa Taylor at xxx-xxx-xxxx or Dr. Laurice Joseph at xxx-xxx-xxxx.

For questions about your child’s rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-xxx-xxxx.

If your child is injured as a result of participating in this study or for questions about a study-related injury, you may contact Dr. Laurice Joseph at xxx-xxx-xxxx.
Signing the parental permission form

I have read (or someone has read to me) this form and I am aware that I am being asked to provide permission for my child to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to permit my child to participate in this study. My returning the completed questionnaire at the end of the study will indicate my consent to also be a participant in the research study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of subject

Printed name of person authorized to provide permission for subject  Signature of person authorized to provide permission for subject

Relationship to the subject  AM/PM

Date and time

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining consent  Signature of person obtaining consent

AM/PM

Date and time
Appendix B: Student Assent Form
The Ohio State University Assent to Participate in Research

Study Title: The Effects of Repeated Writing on Secondary Students' Writing Fluency
Researcher: Ms. Carisa Taylor, Dr. Laurice Joseph, Dr. Moira Konrad, and Dr. Terri Hessler
Sponsor: None

You are being asked to be in a research study. Studies are done to find better ways to treat people or to understand things better. This form will tell you about the study to help you decide whether or not you want to participate. You should ask any questions you have before making up your mind. You can think about it and discuss it with your family or friends before you decide. It is okay to say “No” if you don’t want to be in the study. If you say “Yes” you can change your mind and quit being in the study at any time without getting in trouble. If you decide you want to be in the study, an adult (usually a parent) will also need to give permission for you to be in the study.

1. What is this study about? This study is about repeated writing to build writing fluency. There are several things that can make your writing better. One of them is fluency. Fluency is the ability to get your thoughts onto paper quickly.

2. What will I need to do if I am in this study? As a participant, you will receive one-on-one help with your writing. You will do the same type of writing that you have done in many classes. You will be asked to do your best and communicate with the researcher.

3. How long will I be in the study? The study will take place during the first semester. It will start in October and require about 30 sessions.

4. Can I stop being in the study? You may stop being in the study at any time.
5. What bad things might happen to me if I am in the study? It is unlikely that anything bad will happen to you as a result of participating in this study. You will miss time from study hall and may have to complete assignments at home that you would have otherwise completed during study hall at school.

6. What good things might happen to me if I am in the study? You may become a better writer, which may help you in your academic classes and on standardized tests of writing.

7. Will I be given anything for being in this study? No

8. Who can I talk to about the study?

For questions about the study you may contact Ms. Taylor at xxx-xxx-xxxx or Dr. Joseph at xxx-xxx-xxxx.

To discuss other study-related questions with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at xxx-xxx-xxxx.
Signing the assent form

I have read (or someone has read to me) this form. I have had a chance to ask questions before making up my mind. I want to be in this research study.

Signature or printed name of subject  Date and time

AM/PM

Investigator/Research Staff

I have explained the research to the participant before requesting the signature above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining assent  Signature of person obtaining assent

Signature  Date and time

AM/PM

This form must be accompanied by an IRB approved parental permission form signed by a parent/guardian.
Appendix C: Adult Student Consent Form
The Ohio State University Consent to Participate in Research

Study Title: The Effects of Repeated Writing on Secondary Students' Writing Fluency
Researcher: Ms. Carisa Taylor, Dr. Laurice Joseph, Dr. Moira Konrad, and Dr. Terri Hessler
Sponsor: None

This is a consent form for research participation. It contains important information about this study and what to expect if you decide to participate. Your participation is voluntary. Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate. If you decide to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose: The purpose of this study is to determine if students are able to write more fluently after responding repeatedly in writing to the same or similar writing prompts.

Procedures/Tasks: Students who consent to participate in the study will provide two to three writing samples per week until writing intervention begins. During intervention, students will continue to provide writing samples, but they will also receive feedback on the quantity and quality of their writing and write again on the same topic to incorporate feedback and build fluency in response. The writing intervention and data collection will be conducted by a former English teacher with experience instructing high school students with reading and writing difficulties.

Duration: The study will take place during the first semester of school. It will begin in October and end in January. You will participate in approximately thirty sessions that last approximately 15-30 minutes each. The decision to participate will not affect your relationship with your school, your teachers, or The Ohio State University.

You may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you, and you will not lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.
Risks and Benefits: This study poses minimal risk to students as they will be engaging in writing assignments that are typical across grade level and academic subjects. You may lose study hall time that results in your having to do some homework at home.

There are several benefits for participants in the study. You will receive individual instruction and practice writing, and your growth will be monitored. You will be taught how to evaluate and improve your own writing, skills that may be beneficial in your coursework and on future attempts to pass the OGT. In addition to improved skill, you may feel more confident when asked to write.

Confidentiality:

Efforts will be made to keep your study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your participation in this study may be disclosed if required by state law. Also, your records may be reviewed by the following groups (as applicable to the research):
Office for Human Research Protections or other federal, state, or international regulatory agencies;
The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

Student data will be recorded under an assumed name; however, individual sessions may be observed by employees of the school district or by individuals affiliated with the Ohio State University College of Education and Human Ecology.

Incentives: You will not be paid to participate in this study.

Participant Rights:

You may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you are a student or employee at Ohio State, your decision will not affect your grades or employment status.

If you choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights you may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.
Contacts and Questions:
For questions, concerns, or complaints about the study you may contact Carisa Taylor at xxx-xxx-xxxx or Dr. Laurice Joseph at xxx-xxx-xxxx.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at xxx-xxx-xxxx.

If you are injured as a result of participating in this study or for questions about a study-related injury, you may contact Dr. Laurice Joseph at xxx-xxx-xxxx.
Signing the consent form

I have read (or someone has read to me) this form and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of subject ________________________________ Signature of subject ________________________________

AM/PM

Date and time

Printed name of person authorized to consent for subject (when applicable) ________________________________ Signature of person authorized to consent for subject (when applicable) ________________________________

AM/PM

Date and time

Relationship to the subject ________________________________

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining consent ________________________________ Signature of person obtaining consent ________________________________

AM/PM

Date and time
Appendix D: Scoring Protocol for Dependent Variables
Scoring Protocol

Total Words Written (TWW)
Words Spelled Correctly (WSC)
Correct Punctuation Marks (CPM)
Correct Minus Incorrect Writing Sequences (CIWS)
Percent Correct Sequences (%CS)

1) Count the number of words twice. If the number does not agree, count a third time. Any series of letters, numerals, or symbols separated by a space is counted as a word. Hyphenated words are counted as individual words if segments of hyphenated words could stand alone (ex. Mother-in-law is three words, ex-patriot is one word). This is TWW.

2) Circle misspelled words. A word is correctly spelled if it is a recognizable word in English even if it is incorrect in the current context. Missing apostrophes within contractions or possessives are counted as misspelled (ex. Cant, Susans). Symbols are counted as misspelled words. Variations in handwriting between subjects should be considered and scored consistently. If space and general shape of letter could likely be a correct spelling and letter is formed similarly throughout sample, give the benefit of the doubt and count word as correctly spelled. Subtract the number of circled words from TWW to calculate WSC.

3) Count the number of correct punctuation marks. Apostrophe’s within words are included in spelling count and are not included punctuation count (ex. Can’t is correctly spelled but apostrophe does not count as correct punctuation). Punctuation marks counted are periods, commas, semicolons, colons, question marks, exclamation points, hyphens, quotation marks, underscore, and parenthesis when they are correct for the context and location in the sentence. Punctuation marks at the end of fragments are not counted. The number of correct marks is CPM.

4) Count the number of Correct Writing Sequences (CWS) and Incorrect Writing Sequences (IWS). The space and first letter of the writing is the first sequence. If indented, capitalized, and correctly spelled/used, mark with an upward arrow and continue juncture-by-juncture marking an arrow or a dash if sequence is correct or incorrect. There should be a mark between every word and between every word and punctuation mark. If both elements of a juncture are spelled, punctuated, and used correctly, the juncture is correct and marked with an arrow. There is no mark between the last word and the time marking (slash).

   a. Titles of books, movies, etc. are counted as correctly punctuated if either enclosed in quotation marks or underlined and appropriately capitalized (Ex. -Grapes+of+ Wrath-, or _grapes-of-wrath_).
b. Misspelled words and correctly spelled words out of context are marked as incorrect before and after word (ex. -becuse-, -they’re- instead of their).

c. Mark juncture between end of one line and beginning of another line at the end of the first line. Only the first line will have a mark to the left of an initial word on a line.

d. To facilitate consistency in scoring, run-on sentences are penalized after each independent clause.

e. Fragments are penalized before initial word. Although the end punctuation mark is not counted toward CPM, it is counted as a correct sequence.

f. Compound sentences are not penalized for lack of comma between clauses.

g. Introductory dependent clauses are penalized if lacking a comma between dependent and independent clauses.

h. Words written as compound words that should be separated are penalized at beginning and end of created word. The opposite is true for words written as two words that should be compound with one penalty between the two words (ex. Bath-room, or -alot-).

i. Do not penalize students for random use of capitalized letters when stylistically consistent for the student.

j. Symbols are penalized before and after, just as misspelled words.

k. When standing alone “I” must be capitalized.

Count and record the total number of arrows (CWS) and dashes (IWS).

5). Subtract IWS from CWS and record CIWS.

6). Divide CWS by CWS+IWS and multiply by 100 for %CS.
Appendix E: Writing Prompts in Order Used Per Phase
Prompts used in Phase I and Phase II:

1. Think about what makes a good school. Explain the qualities of a good school.
2. Think about the books you’ve read and the movies and television shows you’ve seen. Name your favorite book, movie, or television show and explain why it is your favorite.
3. If you had been old enough to vote in the last election, for whom would you have voted and why?
4. In 1903, the Wright Brothers made their first flight. Orville and Wilbur had to do a great deal of teamwork in order to be successful. Think of a time you were involved in teamwork. Explain the situation and why you feel teamwork was needed to be successful.
5. Think of a book that you have read and a movie you have seen about the same story. Do you think it is better to read a book before seeing a movie? Why or why not?
6. Think about your favorite piece of clothing. Name that piece of clothing and explain why it is your favorite.
7. Would you change your name if you could? If so, what name would you choose and why. If not, what do you like about your name?
8. Think about a time when you were scared or nervous. Name what made you scared or nervous and explain why you were scared or nervous.
9. Do you think there will ever be a time in the future when the only items actually mailed by the Post Office are packages and all letters and magazines will be sent via email? Why or why not?
10. Think of an important invention that has improved people’s lives. Name that invention and explain how it has improved people’s lives.
11. Think about an activity you enjoy doing. Name that activity and explain why you enjoy doing it.
12. Think about your least favorite subject or class in school. Name your least favorite subject or class in school and explain why you do not like this subject or class.
13. Think of a place you have never been but would like to visit. Name that place and explain why you would like to visit it.
14. Think of an activity you did that made you feel proud. Name that activity and explain why it made you proud.
15. Think about the most important job there is in your school. Name the job and explain why you think it is the most important job in your school.
16. Items, such as marbles, that are safe for older children and adults, can harm small children. Think about the different items in your house that may be dangerous to small children and explain how you or an adult could make them safer.
17. Think about a valuable lesson you have learned. Name the lesson you learned and explain why it was so valuable.
18. Think of one item that would show what life is like in our society in the year 2009. Tell what the item is and explain why you chose it to show what life is like today.
19. Brazilian soccer player, Edison Pele, was born in 1940. In order to become an incredible soccer player, Pele had to practice. What is something that you would like to become better at? Explain what you will need to do in order to improve your skills.
20. Think about one food that you would like to see on the school cafeteria menu every day. Name that food and explain why it should be served in the school cafeteria every day.
21. A patent provides exclusive rights to make, use, and sell an invention for 20 years. Why do you think having a patent is important?
22. Think about a time when you were happy. Name what made you happy and explain why you were happy.
23. Benjamin Franklin wanted the turkey, not the bald eagle, to be our country’s symbol. If you had the opportunity to help decide on our nation’s symbol, what animal would you choose and why?
24. Think about a time when you were angry. Name what made you angry and explain why you were angry.
25. Think about which of your five senses—touch, taste, smell, or hearing—is most important to you. Name which sense is most important and explain why that sense is most important.
26. Daniel Boone was born in 1734. He was best known for his exploration and settlement of the area that later became the state of Kentucky. As a boy, Boone did not attend much school. Do you think it was important for the children of the early pioneer times to attend school? Why or why not?
27. Think about your favorite holiday, tradition, or custom. Name that holiday, tradition, or custom and explain why it is your favorite.
28. Think about the qualities that make a good friend. Identify three qualities that make a good friend and explain why these qualities are important.
29. Have you ever been to an amusement park? Describe your favorite amusement park ride or activity. Why is that ride or activity better than other things in the park? If you have never been to an amusement park, what ride or activity would you like to try and why?
30. Think about what one activity you would like to do on the next rainy day. Name that rainy-day activity and explain why you would like to do this activity on the next rainy day.
31. Think about one object that is important to you. Name the object and explain why it is important to you.
32. Think about your daily routine for getting ready for school. Explain the routine you go through to get ready for school.
33. Think about a person you respect. Name that person and explain why you respect him or her.
34. Think about what you would do if you had $100 to spend on one thing. Name the one thing you would buy and explain why you chose that item.
Prompts Used in Phase III and Phase IV

1. Describe three of your favorite summer time activities.
2. Think about one thing you would like to change about yourself. Name what you would like to change about yourself and explain why you would like to change that one thing.
3. Explain to someone, in writing, what you would do with $1,000.
4. If you could create an educational television show for children, what type of show would it be? What would be the name of the show? What type of information would it contain?
5. Explain to someone, in writing, how to make your favorite type of sandwich.
6. Would you prefer to watch a scary movie at home or in a movie theater? Explain why you would prefer to see it there.
7. How do you think our pets feel when we dress them us in clothing? If pets could talk, describe what thoughts might be going through their minds while they are being dressed.
8. It is recommended that you get 2-3 servings of dairy each day from a variety of milk products. Describe your favorite dairy product.
9. Think about a time when you had fun with a friend or family member. Name that time and explain what you did with your friend or family member.
10. When people visit zoos, they get the opportunity to see a variety of different animals. Do you believe zoos are a good thing to have? Why or why not?
11. Think about a good teacher you have had. Name that teacher and explain what made this teacher so good.
12. If you could take your best friend to a professional sporting event anywhere in the world, where would you take him or her and why?
13. If you could only travel to one foreign country in your entire lifetime, what country would you choose and what would you do when you got there?
14. June 1st is National Donut Day. Many people consider donuts to be a great breakfast food. Describe your perfect breakfast.
15. Think about a job or activity that you really dislike. Name that job or activity and explain why you do not like it.
16. Describe several things that you can personally do to help save our world’s environment.
17. The Bill of Rights identifies the rights of every American citizen such as free speech and the right to vote. If you were to create a Bill of Rights for your school, what rights would you give to students and why?
18. Think about a place where you like to spend time. Name that place and explain why you like to spend time there.
19. Think about something you do really well. Name this activity and explain how you are good at it.
20. If you could design your own home, what would the inside of the home look like?
21. January 16th is “National Do Nothing Day.” If you could invent your own day, what would it be called? What would you want people to do on your special day?
Appendix F: Phase I Script
Phase Script for Phase I: Baseline

Materials: Writing prompts, three sheets of regular ruled notebook paper, folder, ball point pen, mechanical pencil, and stopwatch

1. Sit across from subject. Give subject notebook paper, folder, pen and pencil.
2. Hold up writing prompt so that the subject can see the page but not begin reading the words and give directions: (Subject's name), this page has a writing prompt that I will read to you after I give you directions. You will have one minute to think about your response and five minutes to write. After three minutes of writing, I will tap your paper. When I tap your paper I want you to make a slash mark after the word that you are writing and then continue to write. When five minutes are up, I will tell you to stop. I can re-read the prompt or define any words, but I cannot help you organize or write your response. Write the best paragraph that you can as quickly as you can. I do not expect that you will have time to finish the paragraph in the time allotted. Do you have any questions?
3. Briefly answer any questions related to the directions and redirect conversation back to task if question is tangential.
4. Place prompt in front of student and read prompt out loud.
5. Remind student of directions: Put your pencil/pen down. You have one minute to think starting now.
7. After one minute, state: Now, begin writing.
8. After three minutes tap the subject's paper and observe subject making a mark. If subject does not make a mark, make mark for them.
9. If subject stops writing before time is up state: You still have time to write. If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.
10. After five minutes, state: Stop writing.
11. Collect writing and state: **You will now write again but to a different prompt. Just as before, I will read the prompt and then you will have one minute to think and five minutes to write. Please make a slash mark when I tap your paper.**

12. Place prompt in front of student and read prompt out loud. State: **Put your pencil down. You will have one minute to think starting now.**

13. Start stopwatch.

14. After one minute state: **Try to write more than you wrote the first time. Now begin writing.**

15. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.

16. If subject stops writing before time is up state: **You still have time to write.** If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.

17. After five minutes, state: **Stop writing.**

18. Collect subject writing and materials, and return student to class. Do not discuss prompt, or writing. If subject talks about prompt indicate that he/she did a good job.
Appendix G: Abbreviated Phase I Script
Abbreviated Script for Phase I: Baseline

Materials: Writing prompts, three sheets of regular ruled notebook paper, folder, ball point pen, mechanical pencil, and stopwatch

1. Give subject notebook paper, folder, pen and pencil or have in place when student arrives.
2. State: You will have one minute to think about your response and five minutes to write. Write the best paragraph that you can as quickly as you can.
3. Place prompt in front of student and read prompt out loud.
4. State: You have one minute to think starting now.
5. Start stopwatch.
6. After one minute, state: Now, begin writing.
7. After three minutes tap the subject's paper and observe subject making a mark.
8. If subject stops writing before time is up state: You still have time to write. If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.
9. After five minutes, state: Stop writing.
10. Collect writing and state: You will now write again but to a different prompt.
11. Place prompt in front of student and read prompt out loud. State: You will have one minute to think starting now.
12. Start stopwatch.
13. After one minute state: Try to write more than you wrote the first time. Now begin writing.
14. After three minutes tap the subject's paper.
15. If subject stops writing before time is up state: **You still have time to write.**

   If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.

16. After five minutes, state: **Stop writing.**

17. Collect Materials
Appendix H: Phase II Script
Phase Script for Phase II: Self-Graphing

Materials: Writing prompts, three sheets of regular ruled notebook paper, folder, ball point pen, mechanical pencil, stopwatch, graph paper, red and blue colored pencils

1. Sit across from subject. Give subject notebook paper, folder, pen and pencil.
2. Place bar chart in front of subject and state: **You have written several responses to prompts. This bar graph shows the number of words you wrote the last session. The first time you responded to a prompt, you wrote ____ words. That number is shown here in red.** (Point to red bar.) **The second time when you wrote to a different prompt, you wrote ____ words. That number is shown here in blue.**
3. Hold up writing prompt so that the subject can see the page but not begin reading the words and give directions: *(Subject's name), this page has a writing prompt that I will read to you after I give you directions. You will have one minute to think about your response and five minutes to write. After three minutes of writing, I will tap your paper. When I tap your paper I want you to make a slash mark after the word that you are writing and then continue writing. When five minutes are up, I will tell you to stop. I can re-read the prompt or define any words, but I cannot help you organize or write your response. Write the best paragraph that you can as quickly as you can. I do not expect that you will have time to finish the paragraph in the time allotted.*
4. Point to the bar graph and state: **When you are finished writing, we will count the number of words written and graph the number here.** (Point to next place for data bar.) **Do you have any questions?** Leave bar graph on table in view of student.
5. Place prompt in front of student and read prompt out loud.
6. Remind student of directions: **Put your pencil/pen down. You have one minute to think starting now.**
7. Start stopwatch.
8. After one minute, state: **Now, begin writing.**
9. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.
10. If subject stops writing before time is up state: **You still have time to write.** If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.
11. After five minutes, state: **Stop writing.**
12. Place written response in front of examiner, count words from entire time out loud, and write number at bottom of page.
13. Give subject written response and state: **You wrote ____ words. Graph your results here and use the red pencil for shading.** (Point to place on bar chart and help subject as needed.)
14. Collect writing and state: **You will now write again but to a different prompt. Just as before, I will read the prompt and then you will have one minute to think and five minutes to write. Please make a slash mark when I tap you paper.**
15. Place prompt in front of student and read prompt out loud.
16. State: **Put your pencil/pen down. You will have one minute to think starting now.**
17. Start stopwatch.
18. After one minute, state: **Try to write more than you wrote the first time. Now, begin writing.**
19. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.
20. If subject stops writing before time is up state: **You still have time to write.** If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.
21. After five minutes, state: **Stop writing.**

22. Place written response in front of examiner, count words from entire writing time out loud, and write number at bottom of page.

23. Give subject written response and state: **You wrote ____ words. Graph your results here and use the blue pencil for shading.** (Point to place on bar chart and help subject as needed)

24. Collect subject writing and materials, and return student to class. Do not discuss prompt, or writing. If subject talks about prompt indicate that he/she did a good job.
Appendix I: Abbreviated Phase II Script
Abbreviated Phase II: Self-graphing

Materials: Writing prompts, three sheets of regular ruled notebook paper, folder, ball point pen, mechanical pencil, stopwatch, graph paper, red and blue colored pencils

1. Give subject notebook paper, folder, pen and pencil.
2. Place bar chart in front of subject and state: You have written several responses to prompts. This bar graph shows the number of words you wrote the last session. The first time you responded to a prompt, you wrote ____ words. Point to red bar. The second time when you wrote to a different prompt, you wrote ____ words. Point to blue bar. When you are finished writing, we will count the number of words written and graph the number here (point to next place for data bar).
3. Turn to writing prompt. You will have one minute to think about your response and five minutes to write. Write the best paragraph that you can as quickly as you can.
4. Read prompt out loud.
5. State: You have one minute to think starting now.
7. After one minute, state: Now, begin writing.
8. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.
9. If subject stops writing before time is up state: You still have time to write. If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.
10. After five minutes, state: Stop writing.
11. Place written response in front of examiner, count words from entire time out loud, and write number at bottom of page.
12. Give subject written response and state: You wrote ____ words. Graph your results here and use the red pencil for shading. (point to place on bar chart and help subject as needed)
13. Collect writing and state: **You will now write again but to a different prompt.**

14. Place prompt in front of student and read prompt out loud.

15. State: **You will have one minute to think starting now.**


17. After one minute, state: **Try to write more than you wrote the first time. Begin Writing.**

18. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.

19. If subject stops writing before time is up state: **You still have time to write.** If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.

20. After five minutes, state: **Stop writing.**

21. Place written response in front of examiner, count words from entire writing time out loud, and write number at bottom of page.

22. Give subject written response and state: **You wrote ____ words. Graph your results here and use the blue pencil for shading.** (Point to place on bar chart and help subject as needed)

23. Collect subject writing and materials, and return student to class.
Appendix J: Phase III Script
Phase Script for Phase III: Self-graphing and Repeated Writing

Materials: Writing prompt, three sheets of regular ruled notebook paper, folder, ball point pen, mechanical pencil, stopwatch, graph paper, red and blue colored pencils

1. Sit across from subject. Give subject notebook paper, folder, pen and pencil.
2. Place bar chart in front of subject and state: You have written several responses to prompts. This bar graph shows the number of words you have written in the past few sessions.
3. Hold up writing prompt so that the subject can see the page but not begin reading the words and give directions: (Subject's name), this page has a writing prompt that I will read to you after I give you directions. You will have one minute to think about your response and five minutes to write. After three minutes of writing, I will tap your paper. When I tap your paper I want you to make a slash mark after the word that you are writing and then continue writing. When five minutes are up, I will tell you to stop. I can re-read the prompt or define any words, but I cannot help you organize or write your response. Write the best paragraph that you can as quickly as you can. I do not expect that you will have time to finish the paragraph in the time allotted.
4. Point to the bar graph and state: When you are finished writing, we will count the number of words written and graph the number here (point to next place for data bar). Do you have any questions? Leave bar graph on table in view of student.
5. Place prompt in front of student and read prompt out loud.
6. Remind student of directions: Put your pencil/pen down. You have one minute to start thinking starting now.
7. Start stopwatch.
8. After one minute, state: Now, begin writing.
9. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.

10. If subject stops writing before time is up state: **You still have time to write.** If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.

11. After five minutes, state: **Stop writing.**

12. Place written response in front of examiner, count words from entire writing out loud, and write number at bottom of page.

13. Give subject written response and state: **You wrote ____ words.** **Graph your results here and use the red pencil for shading.** (Point to place on bar chart and help subject as needed)

14. Collect writing and state: **Now, you will write again about the same prompt. Please start over as if you have not written on this topic before. Just as before, you will have one minute to think and five minutes to write.**

15. Place prompt in front of student and read prompt out loud.

16. State: **Put your pencil down. You will have one minute to think starting now.**

17. Start stopwatch.

18. After one minute, state: **Try to write more than you wrote the first time. Now, begin writing.**

19. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.

20. If subject stops writing before time is up state: **You still have time to write.** If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.

21. After five minutes, state: **Stop writing.**

22. Place written response in front of examiner, count words from entire writing out loud, and write number at bottom of page.
23. Give subject written response and state: You wrote ____ words. Graph your results here and use the blue pencil for shading. (Point to place on bar chart and help subject as needed)

24. Collect subject writing and materials, and return student to class. Do not discuss prompt, or writing. If subject talks about prompt indicate that he/she did a good job.
Appendix K: Abbreviated Phase III Script
Abbreviated Phase III Script: Self-graphing and Repeated Writing

Materials: Writing prompt, three sheets of regular ruled notebook paper, folder, ball point pen, mechanical pencil, stopwatch, graph paper, red and blue colored pencils

1. Sit across from subject. Give subject notebook paper, folder, pen and pencil.
2. State: As before, you will have one minute to think and then five minutes to write. Write the best paragraph that you can as quickly as you can.
3. Place prompt in front of student and read prompt out loud.
4. State: You have one minute to think starting now.
5. Start stopwatch.
6. After one minute, state: Begin writing.
7. After three minutes tap the subject's paper and observe subject making a mark.
8. After five minutes, state: Stop writing.
9. Place written response in front of examiner; count words out loud from entire writing. Write number at bottom of page.
10. Give subject written response and state: You wrote ____ words. Graph your results here and use the red pencil for shading. (Point to place on bar chart and help subject as needed)
11. Collect writing and state: You will now write again about the same prompt. Please start over as if you have not written on this topic before. Just as before, you will have one minute to think, and five minutes to write.
12. Place prompt in front of student and read prompt out loud.
13. State: You have one minute to think starting now.
15. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.
16. After five minutes, state: **Stop writing.**

17. Place written response in front of examiner, count words from entire writing out loud, and write number at bottom of page.

18. Give subject written response and state: **You wrote ____ words.** Graph your results here and use the blue pencil for shading. (Point to place on bar chart and help subject as needed)

19. Collect subject writing and materials, and return student to class.
Appendix L: Phase IV Script
Phase Script for Phase IV: Self-graphing, Repeated Writing and Feedback

Materials: Writing prompt, three sheets of regular ruled notebook paper, folder, ball point pen, mechanical pencil, stopwatch, graph paper, red and blue colored pencils

1. Sit across from subject. Give subject notebook paper, folder, pen and pencil.
2. Hold up writing prompt so that the subject can see the page but not begin reading the words and give directions: (Subject's name), this page has a writing prompt that I will read to you after I give you directions. You will have one minute to think about your response and five minutes to write. After three minutes of writing, I will tap your paper. When I tap your paper I want you to make a slash mark after the word that you are writing and then continue writing. When five minutes are up, I will tell you to stop. I can re-read the prompt or define any words, but I cannot help you organize or write your response. Write the best paragraph that you can as quickly as you can. You will not be penalized for not finishing your essay in the time allowed.
3. Place prompt in front of student and read prompt out loud.
4. Remind student of directions: Put your pencil down. You have one minute to think starting now.
5. Start stopwatch.
6. After one minute, state: Now, begin writing.
7. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.
8. If subject stops writing before time is up state: You still have time to write. If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.
9. After five minutes, state: Stop writing.
10. Place written response in front of examiner, count words out loud from entire writing place a star after the 100th word. Write number at bottom of page.

11. Give subject written response and state: **You wrote ____ words. Graph your results here and use the red pencil for shading.** (Point to place on bar chart and help subject as needed)

12. Take back first writing product and state: **I am going to read your entire essay out loud and give you feedback on your spelling, capitalization and punctuation in the first 100 words. As I read I will circle any words that are misspelled, and I will tell you if your capitalization and punctuation are incorrect. Then using your ideas, I will help you construct a good first sentence.**

13. Read written response out loud circling misspelled words. If capitalizations or punctuations are incorrect, state: This should (or should not) be capitalized because it is a ________ (person's name, name of city, etc.). If punctuation is incorrect, state: This should (or should not) be a period/comma/semicolon because it is the end of a sentence/ separates one thing and action from another thing and action in the same sentence/ helps the reader understand the sentence.

14. Based on student response create and write a compound or complex thesis statement. Write sentence below student response.

15. Collect writing and state: **You will now write again about the same prompt. Please start over as if you have not written on this topic before. Just as before, you will have one minute to think, and five minutes to write. Make a slash mark when I tap your paper.**

16. Place prompt in front of student and read prompt out loud.

17. State: Put your pencil down. **You have one minute to think starting now.**

18. Start stopwatch.
19. After one minute, state: **Try to use the feedback on your writing and write even more than you wrote the first time. Now, begin writing.**

20. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.

21. If subject stops writing before time is up state: **You still have time to write.** If subject stops writing or indicates that he/she is finished, continue to look at the stopwatch and do not speak until time is up.

22. After five minutes, state: **Stop writing.**

23. Place written response in front of examiner, count words from entire writing out loud, and write number at bottom of page.

24. Give subject written response and state: **You wrote ____ words. Graph your results here and use the blue pencil for shading.** (Point to place on bar chart and help subject as needed)

25. State: **I will read your second writing out loud and describe any positive changes that you made the second time.** Comments are based on crude inspection and include but are not limited to the following: You spelled more words correctly, You started with a much stronger sentence, Your punctuation was better, You did a nice job incorporating feedback into your second writing. Make at least one, but no more than three positive observations.

26. Collect subject writing and materials, and return student to class. Do not discuss prompt, or writing. If subject talks about prompt indicate that he/she did a good job.
Appendix M: Abbreviated Phase IV Script
Abbreviated Phase IV Script: Self-graphing, Repeated Writing, and Feedback

Materials: Writing prompt, three sheets of regular ruled notebook paper, folder, ball point pen, mechanical pencil, stopwatch, graph paper, red and blue colored pencils

1. Sit across from subject. Give subject notebook paper, folder, pen and pencil.
2. State: As before, you will have one minute to think and then five minutes to write. Write the best paragraph that you can as quickly as you can.
3. Place prompt in front of student and read prompt out loud.
4. State: You have one minute to think starting now.
5. Start stopwatch.
6. After one minute, state: Begin writing.
7. After three minutes tap the subject's paper and observe subject making a mark.
8. After five minutes, state: Stop writing.
9. Place written response in front of examiner, count words out loud from entire writing place a star after the 100th word. Write number at bottom of page.
10. Give subject written response and state: You wrote ____ words. Graph your results here and use the red pencil for shading. (Point to place on bar chart and help subject as needed)
11. Take back first writing product and state: I am going to read your entire essay out loud and give you feedback on your spelling, capitalization and punctuation in the first 100 words. Then using your ideas, I will help you construct a good first sentence.
12. Read written response out loud. If capitalizations or punctuations are incorrect, state: This should (or should not) be capitalized because it is a ________ (person's name, name of city, etc.). If punctuation is incorrect,
state: This should (or should not) be a period/comma/semicolon because it is the end of a sentence/ separates one thing and action from another thing and action in the same sentence/ helps the reader understand the sentence.

13. Based on student response create and write a compound or complex thesis statement.

14. Collect writing and state: You will now write again about the same prompt. Please start over as if you have not written on this topic before. Just as before, you will have one minute to think, and five minutes to write.

15. Place prompt in front of student and read prompt out loud.

16. State: You have one minute to think starting now.

17. Start stopwatch.

18. After one minute, state: Try to use the feedback on your writing and write even more than you wrote the first time. Begin writing.

19. After three minutes tap the subject's paper and observe subject making a mark. If student does not make a mark, make mark for them.

20. After five minutes, state: Stop writing.

21. Place written response in front of examiner, count words from entire writing out loud, and write number at bottom of page.

22. Give subject written response and state: You wrote ____ words. Graph your results here and use the blue pencil for shading. (Point to place on bar chart and help subject as needed.)
23. State: **I will read your second writing out loud and describe any positive changes that you made the second time.** Comments are based on crude inspection and include but are not limited to the following: You spelled more words correctly, You started with a much stronger sentence, Your punctuation was better, You did a nice job incorporating feedback into your second writing. Make at least one, but no more than three positive observations.

24. Collect subject writing and materials, and return student to class.
Appendix N: Participant Questionnaire
Directions: Your opinion of the writing intervention is very important. Please complete this anonymous questionnaire. Place the completed survey in plain envelope on the librarian’s desk. The librarian will sign and date your pass back to class. Thank you for participating in the study and for your feedback.

1. What did you like about participating in the writing activity?

2. What did you dislike about participating in the writing activity?

3. Which activity (graphing, rewriting, getting feedback) helped the most with your writing?

4. Did participating in this writing activity help your other schoolwork? If yes, how?

5. Did participating in this writing activity help you feel more prepared for the Writing Ohio Graduation Test?

6. Would you participate in this writing activity again?

7. Will you continue to use any of the activities to help you prepare for the Writing Ohio Graduation Test? If yes, which one(s)?

Comments: _____________________________________________________________
Appendix O: Parent Questionnaire
Directions: Your opinion of the writing intervention that your son or daughter participated in at school is very important and will help us determine if the instruction was beneficial and how we can make improvements. Please mail the completed questionnaire to the researcher in the enclosed envelope. Thank you for your feedback.

1. What did you like about your child participating in the writing intervention?

2. What did you dislike about your child participating in the writing intervention?

3. What did your child say about the intervention at home?

4. Did you see any improvement in your child's writing during the intervention?

Comments: __________________________________________________________

_________________________________________________________________

_________________________________________________________________
Appendix P: Teacher Questionnaire
Directions: ________________ has completed participation in a writing intervention. Your comments are very important and will help us refine the intervention for future use. Please return the completed questionnaire in a sealed envelope to Carisa Taylor. Thank you for your feedback.

1. Did you notice any difference in the student's writing performance while s/he was participating in the study?

2. Were there any negative consequences for the student as a result of participating in the study? If so, please describe.

3. Upon examination of the intervention scripts, were there any instructional methods (self-graphing, repeated writing, repeated writing with feedback) that you are likely to use in the classroom?

4. Which methods do you think students would find enjoyable?

5. Did the writing intervention appear to be valid and appropriate for increasing writing fluency in secondary students?

6. Do you feel the intervention will help prepare students for the Writing Ohio Graduation Test?

7. Do you have any suggestions for improving the writing intervention or implementation of the study?
Appendix Q: Directions for Qualitative Analysis
Thank you for helping me with the qualitative analysis of my dissertation. This should not take more than 20-30 minutes.

Enclosed are 14 paired writing samples.

1) Read each pair and place a monkey sticker on the better writing of the two. There will be one monkey per pair.

2) As you read, place a star on any writing that you believe to be of sufficient quality to pass the Writing-OGT. If the student had plenty of time to develop the essay, might it meet criteria for at least a Proficient (400+) score? (It is possible that you will place no stars, stars on both writings in a pair, or on every sample.)

3) Please return everything to the white envelope, tape closed, and leave at the front desk.

Thank you very much for your time and feedback.

Sincerely,
Carisa Taylor