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Erica Rochelle Kaldenberg
University of Iowa

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EFFICACY OF A SENTENCE WRITING STRATEGY
FOR POSTSECONDARY STUDENTS WITH SPECIAL NEEDS

by

Erica Rochelle Kaldenberg

A dissertation submitted in partial
fulfillment of the requirements for the
Doctorate of Philosophy degree in
Teaching and Learning
(Special Education)
in the Graduate College of
The University of Iowa

May 2015

Thesis Supervisors: Professor William J. Therrien
Professor John L. Hosp

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CERTIFICATE OF APPROVAL

PH. D. THESIS

This is to certify that the PH.D. Thesis of

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To everyone who made this possible.

Though you can love what you do not master, you cannot master what you do not love.

Mokokoma Makhonoana

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ABSTRACT

Students with Intellectual Disabilities (ID) struggle with writing. Writing is an important skill for everyday life; therefore, it is essential that students with ID receive effective writing instruction. Explicit writing instruction adhering to the Strategic Instruction Model (SIM) has shown to be an effective writing strategy for postsecondary students with ID. However, the impact of simple sentence writing instruction has not been studied for this population. Therefore, the purpose of this study was to assess the efficacy of part I of the *Proficiency in Sentence Writing Strategy* (Schumaker & Sheldon, 1999). Results indicate that students were able to learn and apply the vocabulary concepts needed to use the strategy ($ES = 0.808$), but that the simple sentence writing intervention had no effect on students overall writing quality.

PUBLIC ABSTRACT

Writing is an essential skill. Many people struggle with writing. In particular, data indicate that students with intellectual disabilities (ID) often struggle with this important skill. As more students with ID are attending post-secondary education (PSE), research is needed to support or negate writing instructional strategies for this population. Therefore, this study examined the efficacy of a simple sentence writing strategy for 22 students attending a PSE program for students with ID. Results indicate there is a need for simple sentence writing instruction for postsecondary students with ID and that the *Proficiency in Sentence Writing Strategy* (Schumaker & Sheldon, 1999) provides a framework that is beneficial to students.

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CHAPTER 1

INTRODUCTION

In the past, students with intellectual disabilities (ID) had limited postsecondary opportunities. Most students with ID who graduated high school opted for employment opportunities in sheltered workshops or other low-pay positions (Grigal, & Hart, 2013). Furthermore, many of these students continued to live dependently in adulthood (Bouck, 2012). However, as educational instruction for students with ID has begun to focus more on academics than on providing students with a functional based curriculum (Dever, 1990; IDEA, 2009; Pugach & Warger, 2001) more students with ID are enrolling in postsecondary education programs (PSE; Grigal & Hart, 2010; Newman, Wagner, Cameto, Knokey, & Shaver, 2010; Parent-Johnson et al., 2014).

Recent funding provided by the Higher Education Opportunity Act (HEOA) of 2008 (PL-110-315) supported the development of 27 PSE programs for students with special needs. Today, more than 200 programs for students with ID in the United States (Think College, 2014) serve approximately 6,000 students (Grigal, Hart, & Weir, 2014). As more students with ID and their families see the benefits of PSE (Migliore, Butterworth, & Hart, 2009), the number of programs will grow.

Though it is difficult to quantify the effectiveness of these programs, limited data indicate that students with ID who attended PSE were 26% more likely than their same-ability peers to secure employment (Migliore, Butterworth, & Hart, 2009). These students also typically earn 73% more money per week compared to students with ID who did not attend postsecondary education.

One reason it is difficult to collect efficacy data is that programs vary in structure and focus. For instance, in 2012, Grigal, Hart, and Weir conducted a national survey of institutes of higher education that provided educational access to students with ID. Although they found the number one focus reported by programs was independent living/life skills, they also found programs that focused on employment skills and/or academic skills. Variability was also seen in how much time students participate in campus social activities and in the number of inclusive classes students take with traditional college students (Hart, Grigal, Sax, Martinez, & Will, 2006). Despite this variability, Hart, Grigal, and Weir (2010) found that successful PSE programs included the following: instruction in natural environments, person-centered planning, cross-agency coordination, adoption of universal curriculum, mentoring and coaching, securing competitive employment, development of social pragmatics and communication skills, self-determinism and self-advocacy, and program evaluation.

Even though Hart et al. (2010) identified “promising practices” that PSE programs should consider when working with students with ID, there is a lack of evidence identifying content specific instructional strategies postsecondary/transition programs should use. Because students with ID often struggle academically, PSE programs should focus on improving academic skills—especially the academic skills needed for successful employment (Hosp, Hensley, Huddle & Ford, 2014). One such academic skill is writing. Writing is such an important skill, both socially and professionally, that in 2004, the National Commission on Writing (NCW) concluded that “individual opportunity in the United States depends critically on the ability to present one’s thoughts coherently, cogently, and persuasively on paper” (p. 5).

Although many agree that writing is an important skill, students in the United States struggle with writing. The most recent report of the National Assessment of Education Progress

(NAEP; NCES, 2012) indicated that 54% of the general education students in grade 8 are writing at a basic level, with 20% of them writing at the below basic level. Even more startling is that on the assessment 60% of the students with special needs scored at the basic level, with 34% scoring below that level.

There is very little assessment data on the writing ability of college students, but higher education faculty and employers have noticed that postsecondary students lack writing proficiency (Public Agenda, 2002). College students with special needs struggle even more than their non-disabled peers, and students with ID attending PSE programs may need the most support in writing. Therefore, for students with ID attending PSE, the college campus is another setting where the academic and vocational needs of students with ID can be addressed (Papay & Bambara, 2012).

Research suggests that students (including students with ID) can benefit from writing instruction (Graham & Perin, 2007; Mason & Graham, 2008; Rogers & Graham, 2008; Joseph & Konrad, 2009). Furthermore, students at the postsecondary level with ID can benefit from writing instruction (Woods-Groves et al., 2012a; Woods-Groves, Therrien, Hua, & Hendrickson, 2012b; Woods-Groves et al., 2014; Woods-Groves et al., 2015). But despite this evidence, there are very few studies on writing strategies for students with ID in PSE (Grigal, Hart, & Paiewonsky, 2010). Overall, previous studies were successful, but some students involved seemed to lack basic writing skills—such as sentence writing.

The ability to construct sentences is essential in writing (Phelps, 1987; Saddler, 2013). Sentence writing may appear to be a basic skill, but Flower and Hayes (1981) described how formulating one sentence requires the skills needed to draft a manuscript. For instance, the authors explained that sentence writing involves *planning*, *translating*, and *reviewing* prior to

writing a sentence and while writing additional sentences. In the process of writing sentences, the author must ensure that each sentence flows together and is crafted in a way that the audience receives the intended message.

Research suggests students with ID struggle with sentence writing because of delays in language development and difficulty using linguistic rules (Pierce & Bartolucci, 1977). However, targeted sentence writing interventions have helped students who struggle with this skill (Graham & Perin, 2007; Hillocks, 1986; Mason & Graham, 2008; Rogers & Graham, 2008). To teach sentence writing skills, Saddler (2013) suggested that students should be directly and systematically taught sentence construction because proficiency in sentence writing allows students to (a) transfer their thoughts into text and (b) write the text in a clear and meaningful way.

Sentence writing interventions have been shown to be an effective instructional technique for students prior to postsecondary education (Rogers & Graham, 2008), but the efficacy of sentence writing interventions has yet to be examined with this particular population after high school. Therefore, the main purpose of this study is to assess the efficacy of part I of the *Proficiency in the Sentence Writing Strategy* (Schumaker & Sheldon, 1999) writing curriculum. The students in the study were enrolled in a 2-year postsecondary certificate program for individuals with mild cognitive disabilities at a university in the Midwest. The intervention examined the effects of a simple sentence writing intervention on students' sentence knowledge and overall writing quality. The aim of this study is to provide information on the way effective writing instruction may be infused into postsecondary programs for students with ID. By doing so, we are one step closer to ensuring that PSE programs for students with ID are designed to maximize the positive impact on life outcomes.

CHAPTER 2

LITERATURE REVIEW

Chapter Overview

In this chapter, I will discuss postsecondary programs for students with intellectual disabilities (ID), followed by the academic needs of students with ID. Then I will describe students with ID achievement in writing. Next, I will review the writing research—both at the K–12 setting and at the college level. Then I will focus on writing studies that specifically examined sentence instruction. I conclude this chapter by describing why it is important to explicitly teach sentence writing skills to postsecondary students with ID.

Programs for Students With ID in Postsecondary Settings

The overall population attending postsecondary programs is on the rise, with the number of full-time college students increasing 38% from 2001 to 2011 (NCES, 2013). The number of students with disabilities attending postsecondary programs also continues to grow (Newman et al., 2010; Snyder & Dillow, 2010). During the 2008–2009 school year, the National Center for Education Statistics found that almost 100% of the 1,600 2- and 4-year institutions enrolled students with disabilities and 41% of the institutions reported enrolling students with cognitive difficulties or intellectual disabilities (Raue & Lewis, 2011).

The 2008 amendments to Higher Education Opportunity Act (HEOA; PL 110-315) increased funding for postsecondary programs for students with ID. Since then, more programs have been created to provide students who typically would not have enrolled in postsecondary education with a college experience. There are currently 226 programs in the United States (Think College, 2014), and that number is expected to grow (Hart et al., 2010).

Students choose to take advantage of these postsecondary options for a number of reasons, but students with special needs attending a postsecondary program tend to make more money and are better equipped to live independently than similar students who did not attain postsecondary education (Migloire et al., 2009). In addition, students with ID attending postsecondary education (PSE) have benefitted from an increase in self-esteem and social networks (Hart et al., 2006).

Postsecondary programs for students with special needs vary in duration and focus (Hart et al., 2006). For instance, some programs last for two years and others for four years (Think College, 2014). The focus of the program may also differ from what subjects students study to what setting in which the students learn (Grigal, Hart, & Weir, 2012). Hart and colleagues (2006) described programs in which students with special needs attend general education courses alongside non-disabled peers. Other programs provide students with the opportunity to live in residential halls on-campus with traditional students while they attend smaller specialized classes with other students with ID. Also, postsecondary programs offer an array of program objectives, with some emphasizing independent living skills and other programs stressing academic skills such as reading and writing (Grigal et al., 2012).

The Needs of Students With ID

Students with ID have deficits in adaptive behavior. Adaptive behavior consists of social and practical intelligence (Greenspan, 2006), comprising the skills needed to communicate, interact socially, advocate for ones' self, and adapt to situational demands. When it comes to deficits in adaptive behavior, educational instruction must focus on explicitly teaching age-appropriate and situation-appropriate behavior while taking into account cultural norms (Hunt & Marshall, 2012).

Students with ID by definition (IDEA, 2009) also possess cognitive deficits and have difficulties with metacognition (thinking about one's learning), memory, attention, and generalization (Hunt & Marshall, 2012). These cognitive deficits affect all academic content areas such as math, reading, and writing. For instance, in math, students with ID struggle with organizing and identifying important information in word problems (Englert, Culatta, & Horn, 1987) and following multi-step directions (Montague, 1993). In reading, students with ID have difficulty with reading comprehension (Berry, 1972; Bartel, Bryen & Keehn, 1973). In addition, language development issues coincide with speech disorders and vocabulary acquisition; these challenges impede students' reading ability (Gargiulo & Metcalf, 2013). In the area of writing, students with ID struggle with composing written work using correct grammatical structure and sentence complexity (Gargiulo & Metcalf, 2013).

For students with ID, PSE opportunities enhance the educational programming delivered in the K–12 setting by providing systematic instruction (Hallahan, Kauffman, & Pullen, 2015) to target specific academic skills (Hosp et al., 2014). Research studies for students at the postsecondary level with ID have successfully increased students reading (Hua et al., 2012; Hua, Woods-Groves, Ford, & Nobles, in press; Hua, Woods-Groves, Kaldenberg, & Scheidecker, 2013), math ability (Hua, Morgan, Kaldenberg, & Goo, 2012; Hua, Woods-Groves, Kaldenberg, Lucas & Therrien, 2015), and writing proficiency (Woods-Groves, Therrien, Hua, & Hendrickson, 2012; Woods-Groves et al., 2012; Woods-Groves et al., 2014; Woods-Groves et al., 2015). While all academic skills are important, writing is a necessary skill for all content areas. Furthermore, “writing may be the single overarching academic skill most closely associated with college success” (Conley, 2008, p. 4).

The Importance of Writing

Writing is an important skill educationally, professionally, and socially (MacArthur, Graham, & Fitzgerald, 2006; NCW, 2005). As a student progresses in age, schooling, and career, writing demands increase. In educational setting, writing plays a large role in the assessment of academic content (Graham, 2006a; Troia, 2009). Students are often asked to explain in writing what they know about a certain concept (Altemeier, Jones, Abbott & Berninger, 2006). But when they struggle with writing, they may not be able to demonstrate their understanding. As a student transitions from middle school to high school, more academic grades are tied to writing projects. From high school to college, writing skills become even more important. Therefore, students who do not write well often struggle academically (Hallenbeck, 2002).

Professionally, writing is one of the most important skills for career advancement (NCW, 2005). In order to obtain an interview before securing a job, an individual must submit a cover letter and resume, from which potential employers often form their first impression of the candidate. Therefore, poorly written job application materials can inhibit one's ability to get a job (NCW, 2004). Once employed, employees, even hourly workers, are expected to write clearly and accurately (NCW, 2004). Some researchers have predicted that workplace literacy demands will continue to become more complex—requiring an increase in problem-solving skills and written communication (Smith, 2000).

In addition to the importance of writing professionally in the workplace, writing is an important social skill for maintaining contact with family and friends (MacArthur et al., 2006). The increase of social media outlets has also placed greater demands on an individual's writing proficiency. Moreover, writing is important because many people are required to write every

day. Even a simple task such as sending a text message or writing out a grocery list requires basic writing skills (Berninger, Gargia, & Abbott, 2009).

Students Struggle with Writing

It is unfortunate that many people struggle with writing (MacArthur et al., 2006; NCW, 2004). The current National Assessment of Education Progress (NAEP) assessment shows that the majority of students in grades 8 and 11 cannot write at a proficient level (NCES, 2012). Among eighth grade students, 56% of students scored at the basic level and 15% scored at the below basic level. However, among eighth grade students who received special education services, 63% of students scored below basic, with 34% scoring at the basic level. This lack of writing proficiency is also seen for 11th grade students; 54% percent of general education students scored at the basic level and 17% scored at the below basic level. Among students with special needs, 31% scored at the basic level and 64% scored at the below basic level. Although the majority of students struggle with writing, students with disabilities struggle at a rate four times that of their non-disabled peers on the same writing tasks.

The NAEP results indicated that students struggle with writing prior to graduation, so it is not surprising that students continue to lack proficient writing skills in college. In 2005, the American Association of Colleges and Universities revealed that only 11% of college seniors were able to write proficiently. The National Commission on Writing (2005) reports that 30 percent of college graduates must undergo remedial writing training on the job, further indicating that many students do not leave college with the level of writing skills employers expect.

Why Students Struggle

It is very difficult to conceptualize why students struggle with writing (Berninger & Winn, 2006). One reason for this difficulty is the complex interplay between genetic and

environmental influences. Three areas in the brain are responsible for writing: left middle frontal gyrus, left superior parietal lobule, and left premotor area (Berninger & Winn, 2006). The middle frontal gyrus, located in the left frontal lobe, controls the movement sequences needed for letter generation (Katanoda, Yoshikawa, & Sugishita, 2001). The parietal lobe is where the internal code for letter generation forms whereas the premotor area is responsible for the graphomotor function needed to actually write a letter in the external environments. Although the way these areas work together with other areas in the brain to produce complex writing tasks is not fully understood. It can be assumed that injury or differences in brain function can have an impact on ones' writing ability. As brain imaging techniques continue to improve, research will likely continue to explore the executive functions involved in the task of writing (Berninger & Winn, 2006).

Although there is a nature side that influences individuals' writing ability, there is also a nurture side that takes into account environmental influences. It is often the environmental influences that mold and shape the brain (Prensky, 2001). Hayes (1996) described how environmental influences come from the task environment, which consists of both the social and physical environments. The social environment comprises the instructional setting, the individual writer, and the writer's intended audience; the physical environment is made up of the text itself. In addition, environmental influences such as educational experience can affect a student's ability to write. From an environmental perspective, one reason why a student may struggle with writing is a lack of writing instruction in the public school system (Cutler & Graham, 2008; Graham, Harris, Fink-Chorzempa, & MacArthur, 2003). This may especially be the case for students with special needs, who often encounter fewer writing opportunities in schools (Joseph & Konrad, 2009). Research has suggested that a student's family can also affect

a child's desire to produce written text (Berninger & Colwell, 1985). Another contributing factor to a writer's success is motivation (Hayes, 1996). Motivation can come from different sources, but as Bruning and Horn (2000) argued environment and social/emotional cues can have a positive impact on student's writing ability.

How Students Struggle With Writing

Although it is difficult to pinpoint why a student struggles with writing, it is possible to describe what it looks like when students struggle. To better understand how students struggle with writing, it is important to consider all the skills and processes that must come together to promote writing proficiency. Berninger, Mixokawa, and Bragg (1991) produced a framework demonstrating that writing consists of three levels of development: neurodevelopment, linguistics, and cognitive. The neurodevelopment level is made up of the physical and neurological skills needed to perform handwriting and spelling requirements. The second level, the linguistic level, contains the skills needed to write letters, words, and sentences of appropriate syntax. The final level, the cognitive level, encompasses the skills and strategies needed to write extended tasks. Students who struggle with writing have difficulties in one or more of these areas, and students with ID likely struggle with multiple skills.

Writing Skill Deficits

Neurodevelopment. At the neurodevelopmental level, students may struggle with low-level basic writing skills needed to produce written letters, such as the skills needed (a) to retrieve the alphabet easily from visual memory; (b) for penmanship (i.e., fine motor skills); and (c) for visual-motor integration (e.g., the skills needed to draw a complex geometric symbol [the same skills needed to produce written words.]) It is important to identify these struggles early on for a child. Otherwise, the child may develop an aversion to writing (Berninger et al., 1991).

Linguistic development. Even though a student may have mastered writing the alphabet along with basic spelling skills, the writing process can be strained by the deficits in language skills. Language skills could be constrained at the word, sentence, or paragraph level. Students who struggle with linguistic development have difficulty with tasks that involve rearranging letters to spell words, rearranging words to make complete sentences, or rearranging sentences to form paragraphs (Berninger et al., 1991).

Cognitive development. Berninger et al. (1991) outlined a cognitive development constraint describing how some students have difficulty with the higher order writing processes such as the planning, translating and revising stages described in the Hayes and Flower (1980) model. It may be hard to assess whether a student struggles with planning, translating, or revising, but we can examine cognitive development more broadly by assessing a student's metacognition informally. Englert, Raphael, Fear, and Anderson (1988) described two kinds of metacognitive knowledge that proficient writers must possess: (a) knowledge about the writing process and (b) knowledge of the organizational structures. Informal assessments that require students to hypothetically give advice to another student who is experiencing problems with writing can give an instructor insight into a student's metacognitive processing ability.

Writing Skill Deficits for Students With ID

As a result of the deficits in neurodevelopment, linguistic development, and cognitive development, students with ID score lower than students without disabilities in writing quality, writing quantity, and knowledge of text genres (Graham & Harris, 1997). Students with ID also tend to overestimate their writing ability (Harris, Graham, & Mason, 2003). In addition, research has indicated that students with ID have difficulty with the planning process in terms of generating ideas, choosing topics, and demonstrating domain knowledge, and they often lack the

knowledge of appropriate writing strategies to translate plans into text (Harris et al., 2003). Before working with students at any level (elementary, middle school, high school or postsecondary) on their writing, it is important to understand where the student is struggling.

Academic Demands and Instruction at the Postsecondary Level

As more students are attending college, it is increasingly important to understand the academic demands of higher education institutions. For instructional providers at PSE programs for students with ID, this is also important because as the programs become more inclusive in nature (Grigal, Hart, & Weir, 2014), the academic expectations for students with ID will grow. In general, there is an assumption that college students possess a set of foundational academic skills such as the ability to read, write, and complete basic mathematical equations (Grubb et al., 2011). Despite this assumption, students graduating high school do not always have the prerequisite skills that higher level college classes demand (Fanetti, Bushrow & DeWeese, 2010; Greene & Forster, 2003). Writing is one area in which many undergraduate students struggle (Carter & Harper, 2013). In addition, the writing proficiency of postsecondary students has declined, often requiring additional writing support beyond high school (Burzynski Bullard & Anderson, 2014).

Despite the fact that students are struggling with writing, very few students receive intensive writing instruction at the postsecondary level (Abbate-Vaughn, 2007). In general, college freshmen are required to take one to two writing courses. The type of instruction typically provided to students in higher education settings is constructivist in nature (Fanetti et al., 2010). This approach is reminiscent of the Writer's Workshop (Atwell, 1987) approach. Students are encouraged to seek guidance throughout the writing processes by visiting the campus writing center. Writing centers employ other students trained to work individually with

struggling writers. The approach is very individualized, but focuses on the writing process as a whole, with little time spent on explicitly teaching strategies for a specific writing task. Pure constructivists shy away from teaching step-by-step writing strategies, which they contend may take away from individual voice and creativity (Pressley, Harris, & Marks, 1992). Fanetti et al. (2010) reported that college English professors spend a considerable time teaching and encouraging students to leave behind formulaic approaches to writing, such as the five-paragraph essay, to advance their writing ability.

Cognitive Strategy Instruction

While students without significant writing deficits may benefit from constructivist writing strategies, students who require more support in writing tend to benefit from cognitive strategy instruction (Graham & Harris, 1994), which is not the typical teaching method used in college settings. However, for students with ID attending PSE, writing instruction using strategy instruction has shown to be beneficial (Woods-Groves et al., 2012a; 2012b; 2014; 2015).

Cognitive strategy instruction focuses on teaching instructional methods aimed at increasing student performance on at least one of the cognitive processes (Emig, 1971). These processes are identified in the Hayes and Flower model (1980): planning, translating, and reviewing. Graham (2006a) conducted a meta-analysis of cognitive strategy writing interventions aimed at struggling writers in grades K-12. Effect sizes (*ES*) were calculated for each of the dependent measures. The Cohen's *d ES* was used to describe medium (0.50) to large (0.80) effects (Lipsey & Wilson, 2001) for the group studies, while the percentage of non-overlapping data points (PND) index was used to make comparisons between the single-subject studies. Scruggs, Mastropieri, Cook, and Escobar (1986) described a PND greater than 90% as a large effect; a PND between 70.1% and 90% as a medium effect; a PND between 50.1% and

70% as a small effect; and a PND below 50% as no effect. Graham (2006a) found that overall cognitive strategy writing interventions were effective for students who struggle, with the greatest effect sizes calculated for students who were poor writers ($ES = 1.63$ for group studies and a mean PND of 93% for single-subject studies), and the second largest ES for students with LD ($ES = 1.20$ for group studies and a mean PND of 88% for single-subject studies).

Writing interventions that target the cognitive processes in writing (Graham, 2006a; Hayes, 1996) do so in a variety of ways. For instance, studies can change the writing environment, introduce goal setting, or teach students a strategy that supports them while carrying out the specific steps of a particular writing process (planning, translating, or reviewing; Graham, 2006a). In addition, these important skills may be combined into a more complex writing instructional package to influence students writing by addressing a variety of needs; these instructional packages are often the primary focus of current writing intervention research (Graham, 2006a). Most of these strategy instruction model studies can be disaggregated into three categories: self-regulated strategy development (SRSD); cognitive strategy instruction in writing (CSIW); and the strategic instructional model (SIM).

Strategy Instruction Models

SRSD. SRSD is a specific writing approach that teaches students a strategy to use for completing a writing task, such as planning, composing, and revising (Mason, Harris, & Graham, 2011). All SRSD studies use the same six steps to teach strategy acquisition: develop background knowledge, discuss it; model it; memorize it; support it; and perform independently. SRSD combines different theories such as the cognitive-behavioral intervention model (Meichenbaum, 1977), metacognition (Brown, Campione & Day, 1981), and Vygotsky's sociocultural theory (Vygotsky, 1935/1978). It incorporates explicit instruction combined with

self-regulation to assist students with writing for a variety of reasons (e.g., personal narrative, story writing, persuasive essays, expository essays; Wong, Harris, Graham, & Butler, 2003).

Many reviews and meta-analyses highlight the efficacy of SRSD writing interventions (Graham & Perin, 2007; Mason & Graham, 2008; Rogers & Graham, 2008). In addition, the Graham and Harris (2003) meta-analysis examines the impact of the SRSD writing research alone by synthesizing the findings of 26 studies. The researchers found that SRSD interventions did have an overall positive impact on students' writing ability. Overall *ES* ranged from 1.47 to 3.52 and PNDs from 82% to 100%. The greatest impact was seen on the dependent measures of story elements (*ES* = 3.52, PND = 100%). However, positive effects were also noted for measures of writing quality, story elements, and length.

CSIW. Cognitive strategy instruction in writing (Englert et al., 1991) stresses the importance of four instructional steps: text analysis, modeling, guided practice, and independent application. In addition, collaboration and interactive dialogues are stressed. Think sheets are a common writing tool in CSIW; they guide the student through the steps and procedures of the instructional strategy. Although there is a dearth of quantitative CSIW research (Mason & Graham, 2008), reviews of writing research have indicated that CSIW is an effective writing instructional method (Hallenbeck, 2002; Joseph & Konrad, 2009).

SIM. The Strategies Intervention Model (Deshler & Schumaker, 1988), now called the Strategic Instruction Model (SIM), focuses on eight instructional steps. Each step in SIM (e.g., physical, cognitive, and meta-cognitive) is explicitly explained using a specific set of instructional procedures. When using this model, all instructional providers must (a) teach the purpose behind the strategy; (b) explain when, how, and why the strategy should be used; (c) teach students ways to remember the strategy steps; (d) require students to set appropriate

learning goals related to the strategy instruction; (e) model the strategy; and (f) provide guided practice time (Deshler, Ellis & Lenz, 1996). Unlike the SRSD research base for writing, there has not been a systematic review of the SIM writing research. Therefore, it is necessary to review the studies herein.

SIM literature review. SIM has been used to teach students writing strategies using programs or combinations of programs that are part of the *Learning Strategies Curriculum* (Deshler & Schumaker, 1988). The *Learning Strategies Curriculum* consists of three strands: Acquisition; Storage; and Expression and Demonstration of Competence. Under each strand, there are corresponding programs that target a student's ability to (a) acquire new information (Acquisition); (b) store/remember the information (Storage); and (c) write down the information (Expression; Schumaker & Deshler, 2003). Under the Expression and Demonstration of Competence strand, skills such as sentence writing, paragraph writing, and error monitoring are targeted. There have been eight instructional programs developed for writing: *Fundamentals of Sentence Writing Strategy* (Schumaker & Sheldon, 1998a); *Proficiency in the Sentence Writing Strategy* (Schumaker & Sheldon, 1999); *Paragraph Writing Strategy* (Schumaker & Lyster, 1991); *Error Monitoring Strategy* (Schumaker, Nolan, & Deshler, 1985); *InSPECT Strategy* (McNaughton & Hughes, 1999); *Theme Writing Strategy* (Schumaker, 2003); *Capitalization Strategy* (Schumaker & Sheldon, 2009a); and *Comma Strategies* (Schumaker & Sheldon, 2009b). To date, 13 published studies have used a program from the *Learning Strategies Curriculum* to target students' written expression. Table 1 summarizes the studies.

Table 1
SIM Expression and Demonstration of Competence Studies

Study	Participants	Intervention Design and Duration	Skills Taught	Dependent Measures	Results Average PND or ES
<i>Fundamentals of the Sentence Writing Strategy</i> (Schumaker & Sheldon, 1998)					
No published research was found that used only this intervention.					
<i>Proficiency in the Sentence Writing Strategy</i> (Schumaker & Sheldon, 1999)					
No published research was found that used only this intervention.					
<i>Paragraph Writing Strategy</i> (Schumaker & Lyster, 1991)					
Moran, Schumaker, and Vetter (1981) Study 1	<i>N</i> = 3	Multiple-probe across-paragraph-styles design Students received instruction two times per week for 6 weeks. Each session lasted 50 min.	Paragraph writing strategy (i.e., writing a topic sentence, three detail sentences, and a clincher sentence) was taught along with three paragraph styles: enumerative, sequential, and compare and contrast paragraphs.	Paragraph checklist	PND = 100%
	7th–10th graders			Enumerative	
				Sequential	
				Compare and contrast	PND = 100%

Table 1—continued

Moran, Schumaker, and Vetter (1981) Study 2	$N = 5$ 7th–10th graders	Multiple-probe across- paragraph-styles design	Same intervention as Study 1	Paragraph checklist	PND = 100%
				Enumerative	
		Students received instruction three times per week for 4 weeks.		Sequential	PND = 100%
				Compare and Contrast	PND = 100%
		Each session lasted 2 hours per day.			
Schumaker, et al. (1982)	$N = 9$ 8th–12th	<i>Error Monitoring Strategy</i> (Schumaker, Nolan & Deshler, 1985)			
		A multiple- baseline across- students design	Four types of errors were the focus: capitalization, overall	Teacher- generated written passage	Errors corrected PND = 100%
		Students in the treatment group received a total of 7.5 hours of instructional time.	appearance, punctuation, and spelling.		Errors detected PND = 100%
				Student- generated passage	Errors per word PND = 100%

Table 1—continued

<i>Fundamentals in Theme Writing</i> (Schumaker, 2003)					
Hock (1998)	$N = 56$	Pretest-posttest comparison group design	Tutors incorporated the theme-writing program into English Composition 101 support.	Test of theme writing knowledge	$F = 6.696$ $p = 0.000^*$
	The 28 students were college freshmen student athletes.	Lowest performing 28 students on the ACT received the treatment.		English 101 semester grade	$F = .4553$ $p < .05$ Not statistically significant
	Two students with LD	Students in the treatment group met for 3 hours		Semester grade average	$F = .0383$ $p < .05$ Not statistically significant
	One student with ADHD	per week for 3.5 months.			
<i>Essay Test-Taking Strategy</i> (Hughes, Schumaker, & Deshler, 2005)					
Therrien, Hughes, Kapelski, and Mokhtari (2009)	$N = 52$	Stratified and randomly assigned to either the treatment or control conditions.	Students were taught a six-step essay-writing strategy that focused on (a) analyzing the prompt, (b) outlining a response, (c) writing a response and (d) reviewing the answer.	Strategy specific rubric	ANCOVA $F(1, 37) = 26.6,$ $p < .001^*$
	7th–8th graders	10 average achieving students acted as an additional comparison group.		General essay rubric measure	ANCOVA $F(1, 37) = 5.54,$ $p = .024$ Not statistically significant
		Students in the treatment group received instruction for eight sessions. Each session lasted 42 min			

Table 1—continued

Woods-Groves et al. (2012a)	$N = 16$ Postsecondary students with developmental disabilities	Stratified and randomly assigned to either the treatment or control conditions.	Used same intervention as Therrien et al. (2009)	Strategy specific rubric	ANCOVA $F(1, 14) = 27.07,$ $p < .0001^*$
				General essay rubric measure	
				Aligned components	ANCOVA $F(1, 14) = 87.50,$ $p = .0001^*$
Woods-Groves, Therrien, Hua, and Hendrickson (2012b)	$N = 16$ Postsecondary students with developmental disabilities	Stratified and randomly assigned to either the treatment or control conditions.	Used same intervention as Therrien et al. (2009)	All components	ANCOVA $F(1, 14) = 0.57,$ $p = .463$
				Strategy specific rubric	ANCOVA $F(1, 14) = 14.61,$ $p < .002^*$
				General essay rubric measure	
		Students in the treatment group received instruction for 6 sessions. Each session lasted 50 min		Aligned components	ANCOVA $F(1, 14) = 13.76,$ $p = .002^*$
				General components	ANCOVA $F(1, 14) = 7.12,$ $p = .019^*$

Table 1—continued

Woods-Groves et al. (2014)	<i>N</i> = 19 Postsecondary students with developmental disabilities	Stratified and randomly assigned to either the treatment or control conditions.	Used same intervention as Therrien et al. (2009)	Strategy specific rubric	ANCOVA <i>F</i> (1, 17) = 303.206, <i>p</i> < .001*
				General essay rubric measure	
				-Aligned components	ANCOVA <i>F</i> (1, 17) = 1114.326, <i>p</i> = .001*
		Students in the treatment group received instruction for 10 sessions. Each session lasted 45 min		-General components	ANCOVA <i>F</i> (1, 17) = 13.154, <i>p</i> = .002*

EDIT Strategy (Hughes, Schumaker, McNaughton, Deshler & Nolan, 2010)

Woods-Groves et al. (2015)	<i>N</i> = 19 Postsecondary students with developmental disabilities	Randomly assigned to either the treatment or control conditions	Students were taught a four step strategy that stressed finding and correcting spelling, punctuation, capitalization, appearance and word errors.	Percentage of errors found in researcher-generated passages	
				Posttest	ANCOVA <i>F</i> (1, 17) = 8.157, <i>p</i> < .011*
				Maintenance	ANCOVA <i>F</i> (1, 15) = 5.863, <i>p</i> = .029

Capitalization Strategies (Schumaker & Sheldon, 2009a)

No published research was found that only used this intervention.

Comma Strategies (Schumaker & Sheldon, 2009b)

No published research was found that only used this intervention.

Table 1—continued

		Combined Strategy Research			
Beals (1983)	$N = 9$	Multiple-probe across-strategies design	The students in the experimental writing class received instruction in the <i>Sentence Writing Strategy</i> and then the <i>Error Monitoring Strategy</i> through the use of the eight-stage strategic instructional methodology combined with cooperative-group structures. Students in the comparison class received traditional writing instruction.	Percentage of complete sentences	PND = 100%
	Three students with LD were in the writing treatment group	Three students with disabilities, three high-achieving students, and three low-achieving students within each class served as targeted subjects.		Percentage of complicated sentences (compound, complex, and compound-complex sentences)	PND = 83.33%
	9th–10th graders	Duration not clear.		Error score (the total number of errors divided by the total number of words written subtracted from 100)	PND = 86%

Table 1—continued

Bui, Schumaker, and Deshler (2006)	$N = 113$	All students received the treatment. No control group.	Students were taught condensed versions of	Percentage of complete sentences	$F(1, 57) = 89,$ $p < .001^*$
	14 students with disabilities	Instruction took place throughout the school year.	<i>Fundamentals of Sentence Writing Strategy</i> , the <i>Paragraph Writing Strategy</i> , and the <i>Theme Writing Strategy</i> .	Percentage of complicated sentences (i.e., compound, complex, and compound-complex sentences)	$F(1, 8) = 19.57,$ $p = .002^*$
Schmidt, Deshler, Schumaker, and Alley (1989)	$N = 7$	Multiple-probe across-strategies design was used.	Students were taught the	Percentage of complete sentences	Data were not reported in a way that the PND for each student could be calculated.
	High school	Instruction took place throughout the school year.	<i>Fundamentals of Sentence Writing Strategy</i> , the <i>Paragraph Writing Strategy</i> , the <i>Error Monitoring Strategy</i> and the <i>Theme Writing Strategy</i> .	Percentage of complicated sentences Paragraph (16 points) Errors per word Theme (51 points)	

Note: Expression Strand programs not included in the table are the *SLANT Strategy* (Ellis, 1989) for class discussion, the *Assignment Completion Strategy* (Hughes, Ruhl, Deshler & Schumaker, 1995), the *Test-Taking Strategy* (Hughes, Schumaker, Deshler & Mercer, 1993), the *Quality Quest Planner* (Hughes, Ruhl, Schumaker, & Deshler, 2002), the *Narrative Strategy* (Vernon, Schumaker & Deshler, 2010), * = Significant results in favor of the treatment group;

Overall, the *Learning Strategies Curriculum* has produced statistically significant effects in favor of the treatment group on both proximal and distal measures (e.g., Hock, 1998; Therrien et al., 2009). However, it is clear that more research is needed to replicate these findings. As indicated in Table 1, a recent influx of studies has focused on the writing instruction for students with disabilities at the postsecondary level (Woods-Groves et al., 2012a, 2012b, 2014, 2015). This type of research is important because postsecondary education options for students with developmental disorders are on the rise.

The postsecondary studies from Woods-Groves et al. (2012a; 2012b; 2014; and 2015) used the *Essay Test-Taking Strategy* and the *EDIT Strategy*. The *Essay Test-Taking Strategy* includes an eight-step instructional procedure to teach students how to accurately answer a given essay question using the mnemonic ANSWER to help the students remember the instructional steps. Woods-Groves et al. (2014) reported that students in the treatment group performed better on the ANSWER rubric dependent measure as well as the generalization quality rubric measure. Whereas this study required students to produce their own written responses using a pencil and paper, the *EDIT Strategy* (Woods-Groves et al., 2015) study taught students to apply an editing strategy to previously written documents on the computer. Students in the treatment group using the *EDIT Strategy* out performed students in the control condition on the error correction measure.

Overall, four studies have demonstrated positive significant effects for the treatment group indicating that students at the postsecondary level with ID can benefit from SIM instruction (Woods-Groves et al., 2012a; 2012b; 2014; and 2015). Not only can this population benefit from SIM instruction, but SIM instruction has been shown to have beneficial impacts on students writing.

Writing Instruction for Students with ID

Despite the recent increase in writing research, there remains a limited body of research about students at the postsecondary level with ID. The writing research for K–12 students with ID is larger, yet still sparse. Joseph and Konrad (2009) synthesized writing interventions for students with ID. Their search results yielded eight articles that produced nine studies. The majority of the studies employed a single-subject research design ($N = 6$). The three remaining studies used a pre-experimental design. Similar to past reviews, they found that strategy instruction, the most common independent variable, was an effective method to teach writing (average PND = 100%). In addition, specific cognitive strategy instruction models such as SRSD (De La Paz & Graham, 1997; Konrad & Test, 2007; Konrad, Trela, & Test, 2006) and CSIW (Guzel-Ozmen, 2006) were found to be effective writing strategies for students with ID. In addition, within this research base, cognitive strategy instruction was used to teach a variety of writing skills such as paragraph construction (Konrad & Test, 2007; Konrad et al., 2006), descriptive texts (Guzel-Ozmen, 2006), and more specific writing skills such as sentence construction (Rousseu et al., 1994; Yamamoto & Miya, 1999) for students with ID.

The Importance of Focusing on Sentence Writing

Focusing on sentence writing has a positive impact on a students' proficiency in (a) writing complete sentences and (b) producing correct word sequences (Bui et al., 2006; Viel-Ruma, Houchins, Jolivette, Fredrick, & Gama, 2010; Walker, Shippen, Alberto, Houchins, & Cihak, 2005). The reason behind this correlation may be that sentence writing is a basic building block in the writing process (Phelps, 1987). If students cannot write a simple sentence correctly, they most likely will struggle constructing paragraphs and essays. Therefore, Saddler (2013) suggested that students should be directly and systematically taught sentence construction

because proficiency in sentence writing allows for (a) students to transfer their thoughts into text and (b) the text to be written in a clear and meaningful way.

Furthermore, students with ID struggle with sentence writing due to language deficits (Gargiulo & Metcalf, 2013). Berninger et al. (1991) recognized these language deficits as linguistic deficits, which can manifest at the word, sentence, or paragraph level. However, few studies have systematically explored the writing deficits in students with ID. Acknowledging this lack of writing research for students with ID, Young, Moni, Jobling, and van Kraayenoord (2004) assessed 20 adults with ID on measures of receptive language, reading, and writing. For the writing performance task, subjects were given 10 minutes to write a story after receiving the following writing prompt: “tell me about your pets, family, holiday, or weekend.” Results indicated that 10 subjects wrote between two and eight sentences (median = two sentences), three wrote letters of the alphabet, two wrote single words, three wrote groups of words, and two wrote one sentence; thus indicating adults with ID may lack proficiency in simple sentence writing.

Efficacy of Sentence Construction Instruction

To better understand how to increase the writing proficiency for students with ID who struggle with sentence writing, it is important to first review sentence writing interventions for students in general. To do so, it is necessary to consider Rogers and Graham’s (2008) review in which they located five studies that taught students how to construct simple or complex sentences (Beals, 1983; Eads, 1991; First, 1994; Johnson, 2005; Schmidt et al., 1989). On the measure of complete sentences, the mean PND for the five sentence intervention studies was 86% (*Mdn* = 83%; range 78%–100%).

Although all studies reported complete sentences, not all of the instructional interventions were strictly focused on sentence construction instruction. For instance, Beals (1983) focused on cooperative learning groups, and Schmidt et al. (1989) used an intervention that consisted of four different instructional curricula focusing on sentence writing, error monitoring, paragraph writing, and theme writing. Both of these studies are described in more detail with the *Learning Strategies Curriculum* studies in Table 1.

Although there was a slight focus on the *Sentence Writing Strategy* (Schumaker & Sheldon, 1985), which is part of the *Learning Strategies Curriculum* in Eads' (1991) study, the main focus of this intervention was prompting the use of the simple sentence strategy that was taught before the study began; therefore, the study was not reported in Table 1. However, the study findings are important because the research did conclude that all four middle school students with learning disabilities required minimal prompting to use the sentence writing strategy in the general education classroom. Furthermore, when students were prompted to use the sentence writing strategy, the percentage of correctly written sentences increased. Eads did not address the teaching of the sentence writing strategy, whereas in Johnson's (1995) study identified in Rogers and Graham (2008), the teaching of simple sentences was the focus of the intervention.

Johnson (1995) used the *Sentence Writing Preskill* curriculum (Glaeser, 1990) to teach students to identify subjects and verbs. Johnson described how the *Sentence Writing Preskill* curriculum was being used to teach prerequisite skills needed for the *Proficiency in Sentence Writing Strategy* that was part of the *Learning Strategies Curriculum*. A multiple-baseline across participants design was used to assess the efficacy of the intervention. Thirty-six students

in grades 7 and 8 participated in the study. Seven of the 36 students scored below 70 on the Wechsler Intelligence Scale for Children—Third Edition, a commonly used criterion for ID.

Johnson used four dependent measures to assess the efficacy of the intervention. First, she had the students identify subjects and verbs in a set of given sentences. Second, she had students generate a set of simple sentences following a picture prompt. Third, she used the *Proficiency in Sentence Writing* pretest and posttest that required students to write a variety of sentences following a story prompt, and last, she had the students complete two standardized subtests (*Subtest J-3 Sentence-Writing Grade-Placement Test* from the *Brigance Diagnostic Comprehensive Inventory of Basic Skills-Revised* (CIBS-R) (Brigance, 1999) and the *Writing Fluency Subtest* from the *Woodcock-Johnson III Tests of Achievement* (WJIII; Woodcock, McGrew, & Mather, 2001). Johnson concluded that students improved in their ability to identify subjects and verbs; however, the findings reveal that students with lower ability were not able to correctly identify subjects and verbs independently with 80% mastery. Twenty-nine of the students (80.1%) scored above 80% on this measure. In addition, significant growth was seen on the WJIII, but not on the CIBS-R, and on the *Proficiency in Sentence Writing* measure students increased their percentage of correct sentences from 38.92% to 71.19%.

The last study in this group, First (1994), used a multiple-baseline between subjects design to study the effect of a sentence combining intervention on the students' writing. Three students with emotional behavior disorder who ranged in age from 11 to 13 were the subjects in the study. The study used two dependent measures: a researcher generated measure; and a standardized writing measure (TOWL-2). The intervention lasted 30 minutes and took place over 20 instructional sessions. The researcher reported significant gains on the proximal measure for all students, but this growth was seen only on the distal measure (TOWL-2) for one

of the students. First (1994) differed from Johnson (1995) in that the latter focused on simple sentence instruction.

Focusing on the efficacy of sentence construction writing interventions, in particular simple and complex sentence instruction, another review, Datchuk and Kubina (2012,) systematically located nine studies that targeted this specific skill. The nine identified studies were selected based on the following inclusion criteria: they used a group or single subject research design; the independent variable of the design was a sentence construction intervention; the subjects were K–12 students identified with LD or as K–4 students with writing difficulties; and the study was published in a peer-reviewed journal. The sentence construction studies analyzed by Datchuk and Kubina (2012) also had to use measures that reported sentences or word sequences. The nine studies found in Datchuk and Kubina (2012) were: Anderson and Keel (2002); Bui et al. (2006); Dowis and Schloss (1992); McCurdy, Skinner, Watson, and Shriver (2008); Saddler, Asaro, and Behforooz (2008); Saddler, Behforooz, and Asaro (2008), Saddler and Graham (2005); Viel-Ruma et al. (2010); and Walker et al. (2005).

Simple Sentence Interventions

Four of the nine studies began with simple sentence writing (Anderson & Keel, 2002; Bui et al., 2006; Viel-Ruma et al., 2010; Walker et al., 2005). A simple sentence is a sentence that has at least one subject and one verb (e.g., Jane walked fast.) Two studies (Viel-Ruma et al., 2010; Walker et al., 2005) used the *Expressive Writing* (Engelmann & Silbert, 1983) program, one study used a program called *Reasoning and Writing* (Engelmann & Silbert, 1991), and Bui et al. (2006) used a comprehensive writing intervention called the Demand Writing Instruction Model. All four studies found that students improved syntactic and sentence writing performance following the intervention. A summary of the studies is provided in Table 2.

Table 2
Simple Sentence Interventions

Authors	Participants	Study Design	Duration of the Intervention	Program Implemented	Dependent Measures	Effect Sizes
Anderson and Keel (2002)	<i>N</i> = 10 Six students with LD; Four students with BD Grades 4–5	Pretest Posttest design No control group.	6 weeks that consisted of 25 lessons that lasted between 35 and 50 min each	<i>Reasoning and Writing, Level C</i> was used as the treatment. The program was a Direct Instruction (DI) program that incorporated the five DI components: (a) clear academic objectives; (b) instruction in small group; (c) sequenced instruction targeting the objective; (d) on-going training for the teachers; and (e) continual monitoring of student progress. Instruction focuses on the stages of writing process including writing for a variety of purposes.	Spontaneous Writing component of the Test of Written Language-2 (TOWL-2): A scale with five sets of criteria used to score a writing sample that is prompted by a picture (i.e., “Here is a picture. Plan and write a story about it.”)	TOWL-2 Subtest scores ^a SWQ <i>ES</i> = 0.47 TMS <i>ES</i> = 0.23 CVS <i>ES</i> = 0.08 SMS <i>ES</i> = 0.48 CSpS <i>ES</i> = 0.45 CStS <i>ES</i> = 0.44

Table 2—continued

Bui et al. (2006)	<p>$N = 113$</p> <p>14 students with LD.</p> <p>Grade 5</p> <p>Results are for students with LD.</p>	Pretest	<p>3 months that consisted of 30 lessons lasting between 45 and 60 min each</p>	<p>The Demand Writing Instruction Model (DWIM) was used as the treatment.</p> <p>The program was a combination of the <i>Fundamentals of the Sentence Writing Strategy</i>, the <i>Paragraph Writing Strategy</i>, the <i>Error Monitoring Strategy</i>, and the <i>Theme Writing Strategy</i>.</p>	Proportion of complete sentences	ANCOVA $F(1, 58) = 32$, $p < .001^*$
		Posttest design			Proportion of complicated sentences	ANCOVA $F(1, 8) = 19.57$, $p < .002^*$
		Three classrooms received the treatment, two classrooms did not.			Paragraph writing rubric	ANCOVA $F(1, 8) = 20.4$, $p < .002^*$
					Theme writing rubric	ANCOVA $F(1, 8) = 11.5$, $p = .010^*$
					Text-structure	ANCOVA $F(1, 17) = 14.36$, $p = .001^*$
					Planning-time	ANCOVA $F(1, 17) = 42.78$, $p < .001^*$
					Essay length	Not significant.
					Knowledge of the writing process	Not significant.
	State writing assessment	Not significant.				

Table 2—continued

Viel-Ruma et al. (2010)	<i>N</i> = 6 All students with LD. Grades 9–11 Three students were also English Language Learners.	Multiple-probe across-participants	26 daily lessons that lasted between 30 and 45 min each	<i>Expressive Writing</i> was used as the treatment. The program addressed mechanics, sentence writing, paragraph writing, sentence variety, and editing.	Number of correct word sequences (CWS) TOWL-3: Spontaneous Writing composite scores Text length	Mean PND = 73.66% Average gain of 5.83 points (Not significant) Mean PND = 61.3%
Walker et al. (2005)	<i>N</i> = 3 All students with LD. Grades 9–11	Multiple-probe across-participants	50 daily lessons that lasted 50 min each	<i>Expressive Writing</i> was used as the treatment.	CWS TOWL-3: Spontaneous Writing composite score	Mean PND = 83% Average gain of 5.6 points

Note. CSpS = Contextual Spelling Subtest; CStS = Contextual Style Subtest; CVS = Contextual Vocabulary Subtest; SWQ = Spontaneous Writing Quotient; SMS = Syntactic Maturity Subtest; TMS = Thematic Maturity Subtest

Strategies to Teach Simple Sentence Writing

When looking at how to teach students to write simple sentences, Datchuk and Kubina (2012) located four published studies. Two studies (Viel-Ruma et al., 2010; Walker et al., 2005) used the *Expressive Writing* (Engelmann & Silbert, 1983) program. One study used a program called *Reasoning and Writing* (Englemann & Silbert, 1991), and Bui et al. (2006) used a comprehensive writing intervention that was called the Demand Writing Instruction Model.

The Demand Writing Instruction Model that Bui et al. (2006) used consisted of abbreviated versions of the *Fundamentals of Sentence Writing Strategy* program (Schumaker & Sheldon, 1998)—the *Paragraph Writing Strategy* program (Schumaker & Lyerla, 1991), the *Error Monitoring Strategy* program (Schumaker, Nolan, & Deshler, 1985), and the *Theme*

Writing Strategy program (Schumaker, 2003). Since these writing programs were all part of the *Learning Strategies Curriculum*, which adhered to the SIM instruction approach (Deshler & Schumaker, 1988), Bui et al. (2006) was also included in Table 1. When referring back to the *Learning Strategies Curriculum* research in Table 1, it is evident that a limited number of research studies validates the use of the programs. When looking at the programs that target sentence construction, no published research was located that implemented and discussed the sole impact of the *Fundamentals of Sentence Writing Strategy* or the *Proficiency in the Sentence Writing Strategy*, instead the instructional programs have been used in conjunction with other programs or strategies (Bui et al., 2006; Schmidt et al., 1989).

Teaching Sentence Writing to Students with ID

The simple sentence writing interventions in the Datchuk and Kubina (2012) review targeted students with learning disabilities. Therefore, in addition to summarizing these findings, it is also important to summarize the simple sentence writing interventions for students with ID. Joseph and Konrad (2009) identified two studies that taught students with ID sentence writing (Rousseu et al., 1994; Yamamoto & Miya, 1999), which each used two different approaches to teach sentence writing. Rousseu et al. (1994) used targeted instruction to teach three students with autism and ID how to take two sentences and combine them using a given adjective. The instruction lasted 5 days (each session was 20 minutes). Results indicated that the students' number of adjectives per t-unit increased (PND = 74%). Hunt (1965) defined t-unit as an independent clause and if applicable, the associated dependent clause. It is seen as the smallest unit of language that forms a complete sentence. Yamamoto and Miya (1999) also included three Japanese students with autism and ID. However in this study, the researchers used a computer-based intervention to teach students how to select words with a mouse and to arrange

them in the correct order. The mean number of correct computer based sentences for the three students was 93%, and the mean number of correct vocal sentences was 93%.

Conclusion

The purpose of this literature review was threefold. First, I wanted to highlight the increase of PSE opportunities for students with ID. I outlined the needs of students with ID—both adaptive and academic. In addition, I discussed how students with ID struggle with writing, noting that because writing is an important skill, students at the postsecondary level with ID could benefit from additional writing instruction.

Second, I described how writing instruction at the postsecondary level varies from writing instruction in the K–12 setting, noting that for students who struggle with writing, explicit instruction (not typically found at the college-level) should be used in place of more constructivist approaches (Graham & Harris, 1994). Then, I reviewed previous writing instruction research by systematically examining literature that fell into one of three cognitive strategy categories: SRSD, CSIW, and SIM. After a review of the SIM writing research, I concluded that SIM writing instruction has been used to increase the writing proficiency of students with ID at the PSE. This was further confirmed by additional research that indicated students with special needs (not just students with ID) benefit from cognitive strategy instruction (Graham, 2006a). An additional review of writing research on students with ID indicated a dearth of literature resulting in limited evidence to support the use of cognitive strategy instruction for students with ID (Joseph & Konrad, 2009). Of the eight studies in the Joseph and Konrad review, two studies (Rousseu et al., 1994; Yamamoto & Miya, 1999) focused on teaching students with ID sentence construction, which has been shown to be an important building block to writing more sophisticated texts involving one or more paragraphs (Bui et al.,

2006; Viel-Ruma et al., 2010; Walker et al., 2005). No research has focused on teaching students with ID sentence construction using cognitive strategy instruction. More research is needed in this area, specifically for students at the postsecondary level with ID.

Finally, Woods-Groves et al. (2012a; 2012b; 2014; 2015) have demonstrated that the cognitive strategy model using SIM is effective for increasing the writing ability of students' with ID writing ability at the postsecondary level. However, this research focused on teaching more complex writing strategies that assumes students possess basic writing skills, such as the ability to construct grammatically correct sentences. Without explicit data documenting students' basic writing proficiency prior to and after the intervention, the efficacy of explicit strategy instruction maybe constrained. I see this as a limitation. Therefore, the aim of this study is to document the proficiency of a simple sentence writing intervention for students at the postsecondary level with ID. Similar to Woods-Groves and colleagues (2012a; 2012b; 2014; 2015), a SIM writing strategy will be used (i.e., the *Proficiency in Sentence Writing*; Schumaker & Sheldon, 1999) to accomplish this goal. This also builds on the previous literature base because the *Proficiency of Sentence Writing* curriculum has not been systematically studied for postsecondary students with ID.

CHAPTER 3

METHOD

Overview

This study used part I of the *Proficiency in the Sentence Writing Strategy* (Schumaker & Sheldon, 1999) curriculum to teach students at the postsecondary level with mild cognitive disabilities how to write simple sentences with proficiency. The writing instruction took place during one of the students' normally scheduled class periods (i.e., life skills). The instruction was delivered by the first author with the support of a program staff member. In order to assess the efficacy of the intervention, I administered pre and posttest measures. In addition, I also collected data on delayed and maintenance measures 2 and 4 weeks following the intervention to determine whether the intervention effects were retained.

Participants and Setting

Participants were postsecondary students with mild cognitive disabilities enrolled in a 2-year certificate program at a university in the Midwest. The certificate program is aimed toward developing students' independence and community engagement. The 21 students in this study ranged in ages from 18 to 25; all consented to be participants before instruction took place. Nineteen of the students were white, one was Asian and one was black. Nine students were identified as having an intellectual disability (ID) ($IQ < 70$), two students had a dual diagnosis of ID and autism, four students had a learning disability (LD), four students did not have an identified disability but were IDEA eligible per their state eligibility guidelines, and two had a diagnosis other than that described (i.e., Tourette's Syndrome or Fetal Alcohol Syndrome.) In addition, 11 of the students were female and 12 (52%) came from urban areas. The 21 students were stratified by pretest scores and randomly assigned to either the treatment ($n = 11$) or the

control group ($n = 10$). See Table 3 for a breakdown of the demographic information for each condition.

Table 3
Participant Characteristics

	<u>Treatment (n)</u>	<u>Control (n)</u>
Students	11	10
No identified disability	1	3
ID	6	3
LD	2	2
ID and Autism	2	0
Other	0	2
Age		
Median Age	19	19
Race		
White	11	8
Black	0	1
Asian	0	1
Location		
Rural	5	6
Urban	6	4

Study Design

Twenty-seven students were enrolled in an academic success class. Prior to the intervention, all students completed three pretest measures: the Simple Sentence Quiz (SSQ), the Sentence Writing Test (SWT), and a Curriculum Based Measure for Written Expression (WE-CBM).

A random sample treatment and control design was used to examine the effect of the intervention on students' writing achievement. To achieve balanced variables, data from the SWT pretest were used to rank order students by the percentage of complete sentences that they wrote. Then, students were divided into three academic groupings (low = < 50% of sentences written were grammatically correct, middle = between 50% and 80% of sentences written were grammatically correct, high = between 80% and 100% of sentences were grammatically correct).

The five students from the high academic group were excluded from the study because they demonstrated proficiency in writing complete sentences—scoring 100% on the SWT. An additional student from the middle academic group was also excluded because he scored 90% on the SSQ. Next, the students from the middle and the low academic group were combined and were randomly assigned to either the treatment or the control group using a flip of a coin (i.e., if the coin landed on heads, the student was assigned to the treatment group). See Figure 1.

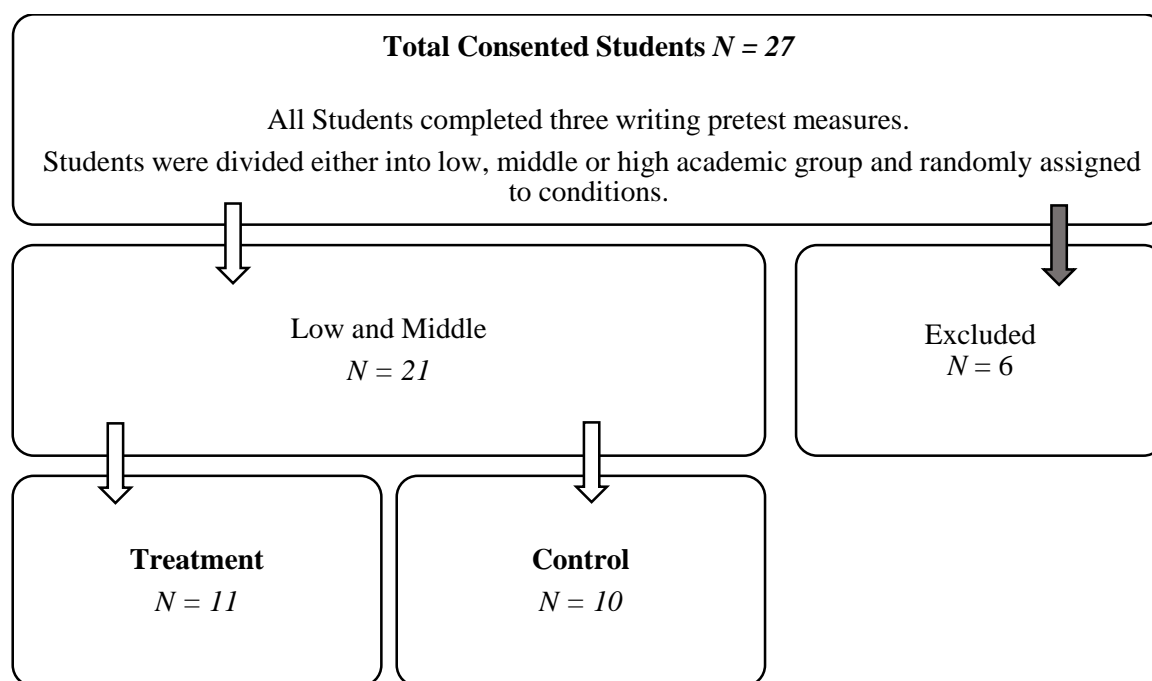


Figure 1. Sample Population

A series of one-way ANOVAs were run on the pretest scores to highlight differences between the control and treatment groups (see Table 4 for pretest scores.) The pretest scores revealed that there was not a significant difference between the treatment and the control group for the four dependent measures chosen. The *p-values* ranged from 0.075 to 0.953.

Table 4
Analysis of Variances for Pretest Scores

Condition	Simple Sentence Quiz: Percentage Correct <i>M (SD)</i>	Sentence Writing Test: Percentage of Non-Sentences <i>M (SD)</i>	Sentence Writing Test: Average Rubric Score <i>M (SD)</i>	WE-CBM: Correct Word Sequences <i>M (SD)</i>
Treatment Group	10.00 (4.26)	65.66 % (36.37%)	2.36 (.81)	27 (17.82)
Control Group	10.10 (3.38)	60.75% (24.53%)	3.0 (.73)	29.3 (9.97)
Cohen's <i>d</i> Effect Size	0.02	0.16	0.83	0.16
ANOVA Comparison	F (1,19) = .003 <i>p</i> = .953	F (1, 19) = .128 <i>p</i> = .724	F (1, 19) = 3.542 <i>p</i> = .075	F (1, 19) = .129 <i>p</i> = .723

Intervention

The intervention followed part I of the *Proficiency in the Sentence Writing Strategy* curriculum instructional manual. Part I focuses on explicitly teaching students what a simple sentence is (i.e., a simple sentence is an independent clause; an independent clause must contain at least one subject and one verb). The instruction also focuses on teaching four varieties of simple sentences (i.e., a simple sentence with: one subject and one verb; two subjects and one verb; one subject and two verbs; and two subjects and two verbs.) The mnemonic PENS is used to help students remember the following strategy steps: **P**ick a formula, **E**xplore words to fit the formula, **N**ote the words, and **S**earch and check (see Figure 2). The instructional manual provides scripted lessons, reproducible materials, and assessments (e.g., SSQ and SWT). While students in the treatment condition received the writing intervention, students in the control group as well as the six students excluded from the study attended their normally scheduled class; the instruction for the students in the control group focused on academic and life skills, not intensive instruction in writing (e.g., effective communication strategies for job interviews).

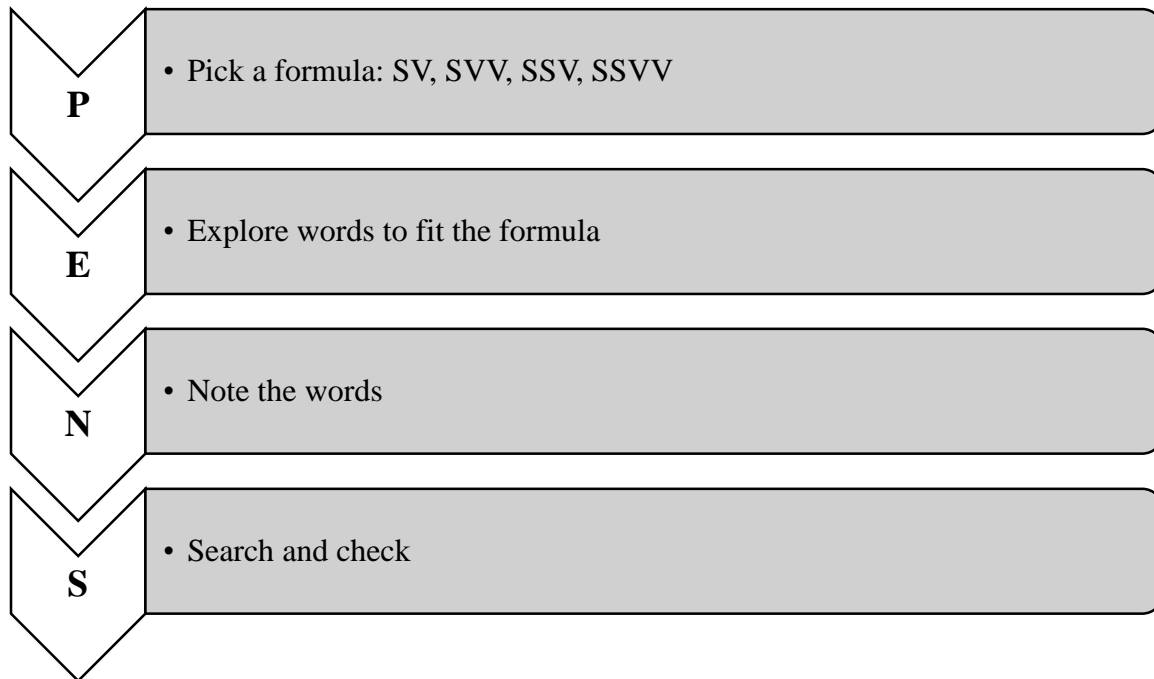


Figure 2. The PENS Strategy

The treatment was aimed at teaching students a learning strategy to write better sentences. Specifically, students were taught the explicit steps of a strategy and how to use the strategy. The *Proficiency in the Sentence Writing Strategy* uses a four-part (e.g., part I, part II) sequence that is delivered following a pretest(s); only part I of the four part strategy was used in this intervention. However, each part of the *Proficiency in the Sentence Writing Strategy* teaches the learning strategy using an eight-stage instructional teaching technique, described in Table 5.

Table 5
The 8-Stage Instructional Technique

Stage of Instruction	Description of the Stage
1: Make Commitments	Students make a verbal commitment to improve on their writing skills.
2: Describe	The instructional strategy is described.
3: Model	Instructor models all of the steps in the instructional strategy while thinking aloud.
4: Verbal Practice	Students verbally rehearse important concepts and definitions.
5: Controlled Practice and Feedback	Students are given ample time to practice the writing strategy. The instructor provided individual feedback as they practiced the targeted strategy.
6: Advanced Practice/Posttest and Feedback	Students are given opportunities to practice the strategy in another settings or under different requirements.
7: Make Commitments for Generalization	Students make commitments to generalize the strategy.
8: Generalization	Four distinct phases of generalization are taught: an orientation phase—describes other situations and circumstances the strategy could be taught; the activation Phase—allows students to practice the strategy in other situations and circumstances; the adaptation phase—explains the strategy could be adapted; and the maintenance phase—focuses on having the instructor periodically check if students are continuing to use the strategy appropriately.

Note. The first day of the intervention took place following the completion of the pretests.

Material. The instructional materials came from the Instructor’s Manual and the Student Lessons Vol. 1 associated with the *Proficiency in the Sentence Writing Strategy*. The invention focused on simple sentences. The Instructor’s Manual provides scripted lessons, which followed the 8-step instructional approach described in Table 5. The *Student Lessons Vol. 1* book

provides the instructor with the quizzes, student worksheets, evaluation guidelines, and answer keys that were used as indicated in the Instructor's Manual. For the intervention, procedures in the Instructor's Manual were followed. However, additional examples and problems were created to provide students extended practice opportunities.

To ensure each lesson was delivered as intended, treatment integrity sheets were developed for each lesson. Each sheet contained a list of instructional components that needed to be completed during each intervention session. Once the instructional component was conducted, the item was checked off on the sheet by an independent observer. For 25% of the sessions, a special education graduate student and a program staff member filled out treatment integrity sheets. For the remaining 80% of the sessions, a program staff member completed the treatment integrity sheets (see Appendix A for an example of the treatment integrity sheet).

Instructional providers. I was the primary instructional provider. I have experience as a special education teacher in the public school setting teaching students with special needs in grades 4–12, and I had previously worked with students in the PSE program. In addition, a staff member with 9 years of educational experience as a high school English teacher and three years of experience as a program specialist for the program provided instructional support and supplemental student assistance throughout the intervention.

Dependent Variables

There were three primary measures used to assess the efficacy of the intervention: WE-CBM, the SSQ, and the SWT. However, in addition to these three, the SWT was also scored using an analytic rubric to further assess the intervention effect on overall writing quality. See Figure 3 for the alignment of the measures (i.e., proximal or distal) to the intervention.

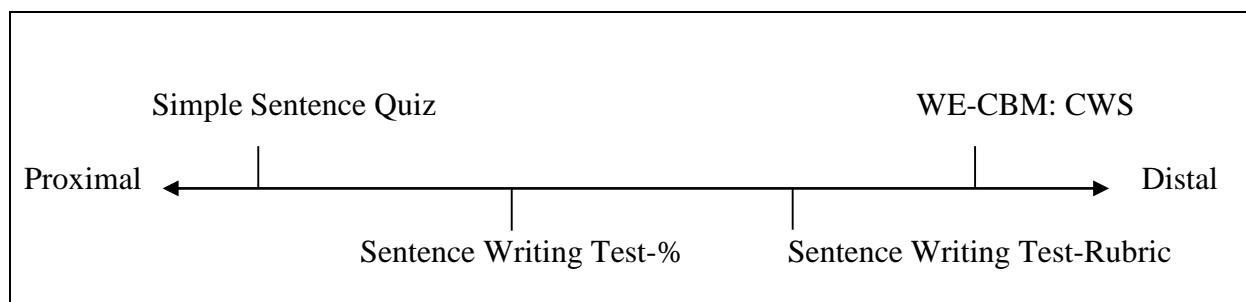


Figure 3. Proximal-Distal Continuum

SSQ. The SSQ came directly from the *Proficiency in the Sentence Writing Strategy* curriculum. The SSQ was a fill-in-the-blank type of assessment containing 20 questions that assessed student’s understanding of independent clauses, subjects, and verbs (i.e., verbs and helping verbs). The assessment was unique in that it provided students with necessary background information (e.g., “The subject of a sentence names the person, place, thing, quality, or idea the sentence is about.”), but required students to identify either the subject (i.e., “What is the subject of the sentence?”) or the verb (i.e., “What is the verb?” or “What is the complete verb? [complete verbs include the main verb and any helping verbs in the sentence]).

SWT. The SWT also came directly from the *Proficiency in the Sentence Writing Strategy* curriculum. For the SWT, students were given a story starter (i.e., If I had a million dollars, I would...) and had 30 minutes to write. However, not all students wrote for the entire time. Students who finished before the 30 minutes were up were asked to sit quietly and wait for their classmates to finish. If a student did finish early, he or she was prompted by “Are you all done? Is there anything else you would like to write? Do you have at least six sentences written?” The prompt “Do you have at least six sentences written?” was given because according to the *Proficiency in Sentence Writing Strategy* assessment material, students needed to write six sentences. For some students, the separation between one sentence and the next was not always

clear (e.g., capitalization and punctuation marks were not used or were used incorrectly); therefore, we had the students determine if they had written six sentences. Once students had completed the SWT writing assessments, two scorers analyzed each writing sample for (a) the total number of sentences written and (b) the number of correct/incorrect sentences written.

Analytic writing rubric. The SWT samples were scored again using the *Six Traits (Plus One)* analytical writing rubric (Spandel, 2008). The *Six Traits (Plus One)* writing rubric has been recommended by researchers to use in conjunction with writing measures that examine content (Scott, 2009). Calfee and Miller (2013) cited this specific rubric as the most popular of the analytic rubrics. The rubric examines aspects of text: ideas, organization, voice, word choice, sentence fluency, conventions, and presentations (Spandel, 2008). Analytic measures have been cited as valuable because they break down the writing process into important parts instead of examining a single piece of writing in its entirety as a holistic writing rubric would do (Kozlow & Bellamy, 2004).

WE-CBM. For the WE-CBM writing task, students were required to complete three 3-min writing prompts prior to and following the intervention. For the delayed and maintenance measures, students were asked only to complete one prompt. To complete the prompt, students were given 1 min to think about the prompt and 3 min to write. See Appendix B for a list of the prompts. For each WE-CBM measure, the total number of words written, number of correct writing sequences, and number of incorrect writing sequences were calculated (see Appendix C for information on how to calculate the number of incorrect writing sequences.) Using the number of correct writing sequences and the number of incorrect writing sequence indices, we also calculated the number of correct minus incorrect writing sequences.

Technical adequacy of dependent measures. Technical adequacy information is not available for the SSQ. However in regards to the other measures, past research has demonstrated that the SWT and the analytic rubric can effectively capture changes in students' writing. For instance, Johnson (2005) used the SWT as a dependent measure after a simple sentence writing invention to record the percentage of complete sentences that students wrote prior to and following the intervention. This measure was also used in a similar way in Schmidt et al. (1989). (See CHAPTER 2).

The *Six Traits (Plus One)* analytic writing rubric (Spandel, 2008) has been used in previous writing research studies to analyze students' writing performance (Paquette, 2009; Dinnen & Collopy, 2009). Jonsson and Svingby (2007) reviewed reliability and validity data reported in studies using rubrics in general. Overall, Jonsson and Svingby concluded that rubrics, in particular analytic rubrics, enhance the consistency of scoring of different writing samples by multiple raters (inter-rater reliability ranging from 55% to 75%). Few published studies have examined external validity. However, Jonsson and Svingby found rubrics to be useful tools to communicate assignment expectations and to provide feedback to students. Validity and reliability coefficients were not reported for specific rubrics such as the *Six Traits (Plus One)* rubric used in this study.

WE-CBM has been shown to be a robust assessment used to measure student's writing skill (Hosp, Hosp, & Howell, 2007). WE-CBM has also been found to be a reliable and valid method for assessing written expression (McMaster & Espin, 2007), with alternate form, and test-retest reliability estimates ranging from .60 to above .92 and validity coefficients ranging from .49 to .88. Hosp et al., (2014) demonstrated that WE-CBM is an appropriate measure to use to monitor writing progress for postsecondary students with ID. In addition, Hosp et al.

(2014) indicated that the number of correct word sequences, which is a broad writing measure taking into account spelling, syntax, and semantics, produced the highest correlation between the Broad Written Language score of the Woodcock-Johnson III Tests of Achievement (Woodcock, McGrew & Mather, 2001) compared to the total number of words written or the number of words spelled correctly.

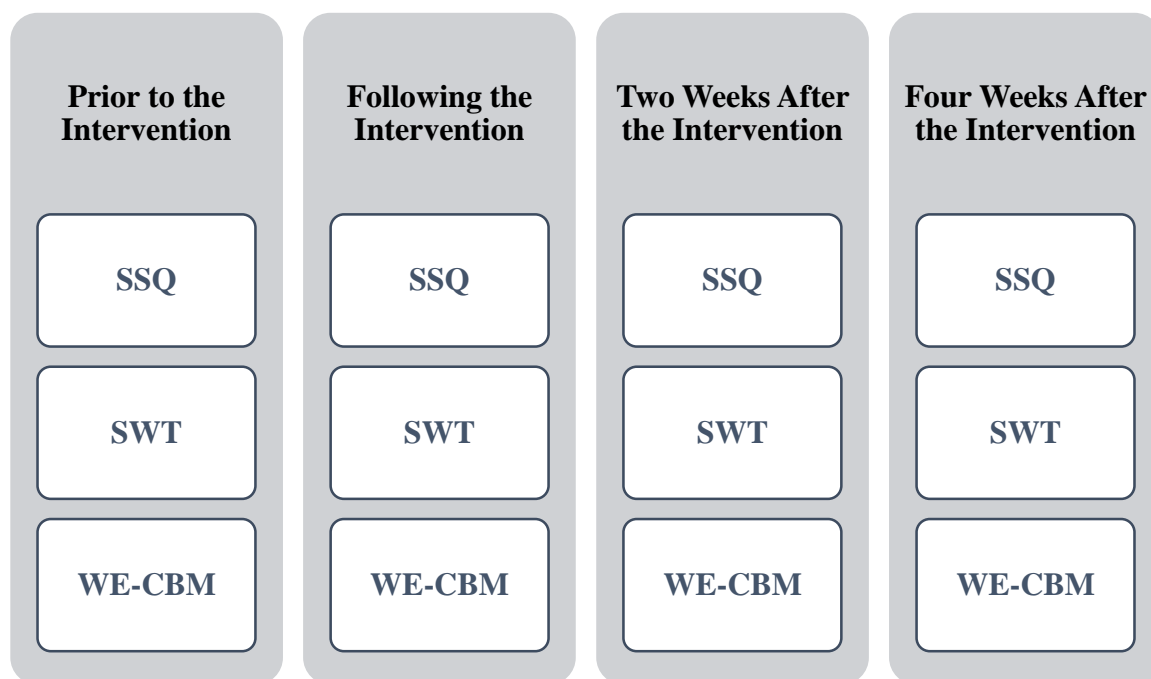


Figure 4. Administration of the Dependent Measures

Administration of dependent measures. Prior to the randomization of students to conditions, consented students ($N = 27$) were given three pre-intervention assessments: SSQ, SWT, and WE-CBM. Data collection for the pretest and posttest measures took place over 2 class days. During this time, three WE-CBM probes were administered (each administration lasting 4 min). This was done so the median score from the three measures could be used for the analysis. However, due to time constraints, data collection for the delayed and maintenance

measure each took place over 1 class day. Therefore, only one WE-CBM probe was collected. See Figure 4 for the timeline of the administration of the dependent measures.

Procedure

All 27 students consented to be in the study and completed the three pretest measures. Following the administration of pretest measures and the random assignment of participants, part I of the *Proficiency in the Sentence Writing Strategy* was taught as prescribed in the instructor's manual and the student workbook associated with curriculum to students in the treatment condition. The intervention consisted of 16 sessions, with students meeting two times a week for 8 weeks. Each session lasted 45 min. The eight-stage instructional technique in Table 5 was used to teach the writing strategy, and the instructional activities for each day of the intervention are outlined below.

Intervention Day 1 (Stage 1—Make Commitments): The instructor distributed the scored SWT assessments to the students. The scoring methods were explained, and the instructor walked around the room and visited with each student individually to discuss his or her results. Next, the instructor and the students completed an 8-min brainstorming activity (4-min brainstorm about “Where and when are people required to write?” and a 4-min brainstorm about “Why is it important to be a good writer?”). Following the brainstorming session, the instructor and the students made commitments to learn/teach the sentence writing strategy by signing a document that stated either “I will do my best to teach you the sentence writing strategy” or “I want to learn the sentence writing strategy.”

Intervention Day 2 (Stage 2—Describe): Stage 2 was the main focus of this instructional session. The class began (similar to Day 1) with a quick brainstorm (i.e., “How do you suppose improved sentence writing skills might help you in school?”). The instructor explained the

benefits other students have seen when using this strategy, and then students compared and discussed two different pieces of writing from a student; one writing sample was written prior to the intervention, and the other writing sample was written following the intervention. The last part of the instructional session required students to set goals for what they wanted to achieve (e.g., 100% proficiency writing simple sentences with the correct conventions) and the time frame in which they wanted to achieve it (e.g., 12 class sessions).

Intervention Days 3–4 (Stage 2—Describe): This class began by providing students with the basic definitions of a simple sentence, an independent clause, a subject, and a verb. Students took notes using researcher generated guided notes (see Appendix D). The instructor modeled how to find the subject and the verb in a variety of simple sentences. The students then had the opportunity to practice locating the subject and verbs in sentences themselves. During this lesson, students were exposed to simple sentences with one main subject and one main verb (e.g., Suzy ran to the store). On Day 4, the instructor modeled finding subjects and verbs again, and the students practiced finding subjects and verbs on their own.

Intervention Days 5–8 (Stage 2—Describe): Students began each instructional day from Day 5 to Day 16 graphing their scores from the previous day's independent practice. On Day 5, once the graphing was complete, the instructor gave the students general feedback and discussed the correct answers from the independent practice. Next, the instructor distributed the helping verb list to students and demonstrated finding complete verbs (main verbs + helping verbs = complete verbs.) Students had the opportunity to practice finding and writing complete verbs and subjects during the independent practice time. The criterion for moving on to the next instructional phase was 80% mastery. (For this session, students had to correctly identify the subject and complete verb for 8 out of 10 sentences on the independent practice assessment.) To

ensure individual mastery, students practiced finding the main verb and helping verbs for four instructional sessions, with students completing an average of four 10-question sentence assessments.

Intervention Day 9–10 (Stage 2—Describe): During classes 9 and 10, students were taught 4 different formulas for writing simple sentences (one subject, one verb [SV]; two subjects and one verb [SSV]; one subject and two verbs [SVV]; and two subjects and two verbs [SSVV]). Students had the opportunity to use this new material through guided and independent practice.

Intervention Day 11 (Stage 2—Describe; Stage 3—Model; Stage 4—Verbal Practice): This session began by wrapping up Stage 2. The instructor reviewed the material from the previous session and introduced the mnemonic PENS. Stage 3 began with the instructor modeling the sentence writing strategy using PENS (**P**ick a formula, **E**xplore words to fit the formula, **N**ote the words, **S**earch and check). This session ended with Stage 4, verbal practice.

Interventions Day 12–13 (Stage 4—Verbal Practice; Stage 5—Controlled Practice and Feedback): The class reviewed Stage 4 using a rapid-fire question-and-answer exercise before moving onto Stage 5. Stage 5 began with the instructor introducing (modeling and guiding the students through a few examples) the Simple Sentence Lesson 2A curriculum worksheet. Once a student demonstrated mastery by scoring 80% or higher, he or she was instructed to complete the Simple Sentence Lesson 3A curriculum sheet, which required students to write 10 sentences: two for each of the four kinds of simple sentences and two sentences of their own. Students were also instructed to follow the PENS steps while writing their sentences.

Intervention Days 14–16 (Stage 6—Advanced Practice and Feedback): Before students took the posttest, they were required to write six sentences, including all four types of sentences,

about the same topic. Students worked independently to master this goal. While students were working, the instructor provided corrective feedback and positive verbal praise to assist students along the way.

Posttest Day 1 (Stage 6—Posttest): The following week, students from both the treatment and control group came together to complete two WE-CBM probes and the SSQ.

Posttest Day 2 (Stage 6—Posttest): Two days later, all students met again to complete the final WE-CBM probe and the SST.

Two weeks following the first posttest day, students in the treatment and the control group completed the following delayed measures: one WE-CBM writing probe; the SSQ (form B); and the SWT. Then again, four weeks following the first posttesting day, students completed the same assessments again. Due to time constraints (i.e., the semester coming to an end), Stage 7—Make Commitments for Generalization and Stage 8—Generalization were not taught.

Data Analysis

Using SPSS 22.0 (2013), a two-way MANOVA using testing-time (i.e., pretest, posttest, delayed, and maintenance) as the within-subjects factor and condition (i.e., treatment or control) as the between-subjects factor was used to determine the overall differences for the metrics.

CHAPTER 4

RESULTS

Chapter Overview

In this chapter I will describe the findings of the simple sentence writing intervention that used a treatment/control with random assignment design to test the efficacy of the intervention. During this 8-week instructional study, 11 students attending a postsecondary education (PSE) program for students with ID were taught part I of the *Proficiency of Sentence Writing* (Schumaker & Sheldon, 1999) program. Using a multivariate analysis of variance (MANOVA), the performance of the students in the treatment group were compared to that of a control group consisting of 10 students attending the same PSE program. Before discussing the findings of the MANOVA, I will examine the inter-rater agreement obtained while scoring the outcome measures. Second, I will describe the null hypotheses that were tested. Then, I will present the results of the statistical analyses followed by a description of the additional exploratory analyses that were done.

Inter-Rater Agreement of Scoring

Treatment integrity checklists. The program staff member completed treatment integrity checklists for 100% of the intervention sessions. For 25% of the sessions, a special education graduate student also observed the instructional session and completed the treatment integrity checklist. Following each intervention session, I collected and analyzed the treatment integrity checklists. One hundred percent of the instructional objectives were delivered according to the treatment integrity sheets filled out by the program staff member, and 100% of the four sessions observed by the special education graduate student also indicated that 100% of the instructional objectives were covered.

Dependent measures. All data samples were deidentified and scored by at least two people. A special education graduate student and I scored the Simple Sentence Quizzes (SSQs). The Sentence Writing Tests (SWTs) were scored first to determine the percentage of incorrect sentences students wrote. A retired high school teacher and I independently scored all SWT-% writing samples; all discrepancies were reconciled after consulting with the program staff member (who also had experience as a high school English teacher).

The SWTs were scored a second time using an analytic rubric (SWT-Rubric). A special education graduate student (the same student who scored the SSQ) and I determined these scores. Each of us graded the writing sample separately and then reconciled discrepant scores. Before using the analytic rubric, we completed the scoring training as described in Spandel (2008). Last, another special education graduate student and I scored the WE-CBM probes. Similar to the scoring methods used for the SWT, each WE-CBM writing probe was scored independently and then the scores were reconciled. Initial inter-rater agreement was as follows: SSQ = 99.41%, SWT = 97.5%, Rubric = 78.86%, WE-CBM: Correct word sequences = 89.64%, total words written = 98.52%, words spelled correctly = 96.63%, and incorrect word sequences = 76.65%.

Hypothesis Testing

This study investigated the following null hypotheses using a MANOVA.

H_{01} = There is no difference between how students in the control or treatment group performed on the writing measures in terms of the amount of change that occurred from the pretest, posttest, delayed test, and maintenance test.

H_{02} = There is no difference between students' scores on the pretest, the posttest, the delayed test, or the maintenance test.

H_{03} = There is no difference between the treatment group and control group on the dependent measures, which were given at four different times.

Dependent measures in the MANOVA. The measures were chosen for the design.

- 1) Simple Sentence Quiz (SSQ)
 - a. The percentage of correct answers on the 20 point assessment
- 2) Sentence Writing Test
 - a. The percentage of non-sentences written (SWT-%)
 - b. The average rubric score for each student (SWT-Rubric)
- 3) Curriculum based measure for written expression (WE:CBM)
 - a. The number of correct word sequences written (CWS)

Assumptions of the Statistical Analyses

The homogeneity of variance was evaluated using Mauchly's Test of Sphericity. There was a violation for two of the dependent variables (SSQ-% and SWT); therefore, the degrees of freedom were adjusted accordingly. (See Appendix E for the results of the homogeneity tests).

Findings

The efficacy of Part I of the *Proficiency in Sentence Writing* intervention was examined using the Wilks' Lambda test statistic for the MANOVA. These tests were conducted using an alpha of 0.05. Table 6 indicates the means and standard deviations for each group on each dependent measure for each testing time.

The means and standard deviations will be discussed in greater detail with the results of the interaction and main effects. However, in general, the students performed as expected on the SSQ-%, the dependent measure most closely aligned to the intervention and the measure of greatest interest. Students in the treatment group and control group performed similarly on the

SSQ-% pretest, whereas students in the treatment group outperformed the students in the control group on the posttest, delayed test, and maintenance measure. Results for the other three measures do not follow this exact trend and will be discussed in more detail below.

Table 6
Means and Standard Deviations for Each Group on Each Dependent Measure

Dependent Measure Per Condition	Pretest <i>M (SD)</i>	Posttest <i>M (SD)</i>	Delayed <i>M (SD)</i>	Maintenance <i>M (SD)</i>
Treatment				
SSQ	10.00 (4.2)	14.55 (4.82)	15.00 (3.63)	15.54 (2.91)
SWT	65.66 (36.37)	41.12 (33.28)	34.26 (33.11)	39.39 (34.12)
Rubric	2.36 (0.81)	3.17 (.83)	2.95 (1.06)	2.98 (1.07)
CWS	27.00 (17.82)	29.54 (14.05)	29.64 (15.59)	27.09 (18.88)
Control				
SSQ	10.10 (3.38)	10.7 (4.52)	12.4 (3.17)	13.10 (2.38)
SWT	60.75 (24.53)	34.60 (25.77)	46.32 (26.87)	40.86 (25.97)
Rubric	3.00 (0.73)	3.57 (0.85)	3.62 (0.83)	3.08 (0.82)
CWS	29.30 (9.97)	29.60 (13.98)	32.30 (17.23)	31.90 (9.87)

Test of the interaction (group x time). The purpose of the 2 x 4 MANOVA was to determine whether the independent variables (group and time) had a diverse effect on the dependent variables. The interaction (group x time) was not significant ($F(12, 8) = 1.911, p = .182$), which indicated the intervention overall did not differentially influence student's writing achievement, which was measured by the four dependent variables. Following the test of the interaction, the main effects on time and the intervention were examined.

Test of the time effect. The main effect of time was significant, $F(12, 143.162) = 6.343, p = .002$, indicating that there was a significant difference in the groups' performance of the dependent variables between testing times. Univariate analyses (2 x 4 ANOVAs) were run for each of the dependent variables separately. Significant results were found for the following dependent measures: the SSQ, $F(1.975, 37.526) = 16.769, p < 0.001$; the SWT $F(2.680, 50.927)$

= 7.492, $p < 0.001$, and the rubric $F(2.942, 55.903) = 10.477, p < 0.001$. However, there was not a significant effect on the average number of CWS $F(2.810, 53.395), p = 0.700$. Therefore, the significant time effect results on the SSQ, the SWT, and the rubric will be discussed in more detail.

SSQ. To further explore the time effect, I ran post-hoc contrasts with paired comparisons to the pretests. There was a significant difference seen for the SSQ between the pretest and the posttest, $F(1, 19) = 7.724, p = 0.012$, the pretest and delayed measure, $F(1, 19) = 46.482, p < 0.001$, and the pretest and the maintenance measure $F(1, 19) = 73.829, p < 0.001$. This finding indicated that as a whole group, students in the treatment and control groups performed significantly better on the tests following the initial pretest. Table 7 presents the means and the standard deviations for the students (treatment and control combined) for each testing time.

Table 7
Total Means and Standard Deviations for the Simple Sentence Quiz

Measure	Pretest <i>M (SD)</i>	Posttest <i>M (SD)</i>	Delayed <i>M (SD)</i>	Maintenance <i>M (SD)</i>
Simple Sentence Quiz	10.05 (3.77)	12.71 (4.97)	13.76 (3.59)	14.42 (2.9)

SWT-%. There was also a significant time effect for the percentage of non-sentences that students wrote. When referencing the pretest, the change in the percentage of non-sentences students wrote was apparent. As indicated in Table 8, students in both the treatment and control groups decreased the percentage of non-sentences written from the time between the pretest and the posttest. Although this number changed only slightly from the posttest to the delayed and maintenance test, the comparison to the pretest was significant (pretest to posttest comparison, $F(1, 19) = 27.728, p = 0.000$, pretest to delayed comparison, $F(1, 19) = 7.724, p = 0.008$, and pretest to maintenance comparison, $F(1, 19) = 12.462, p = 0.002$).

Table 8
Total Means and Standard Deviations for the Sentence Writing Test

Measure	Pretest <i>M</i> (<i>SD</i>)	Posttest <i>M</i> (<i>SD</i>)	Delayed <i>M</i> (<i>SD</i>)	Maintenance <i>M</i> (<i>SD</i>)
Sentence Writing Test: Percentage of Non-Sentences	63.32% (30.64%)	38.33% (29.04%)	40.00% (30.18%)	40.08% (29.77%)

SWT-Rubric. The SWT was also scored using a rubric. Table 9 indicates the average rubric score for all students on the pretest, the posttest, the delayed, and the maintenance tests. The tests of within-subjects contrasts indicate that there was a statistically significant increase in performance on the writing rubric from the pretest to the posttest, $F(1, 19) = 40.977, p < 0.001$, from the pretest to the delayed test, $F(1, 19) = 13.233, p = 0.002$, and from the pretest to the maintenance test $F(1, 19) = 5.378, p = 0.032$. Contributing to these results, on average, students in the control group scored higher on this assessment, beginning with the pretest. Although both the treatment and control groups performed better on the posttest, the treatment group consistently outperformed the students in the control group on this metric.

Table 9
Total Means and Standard Deviations for the Writing Rubric

Measure	Pretest <i>M</i> (<i>SD</i>)	Posttest <i>M</i> (<i>SD</i>)	Delayed <i>M</i> (<i>SD</i>)	Maintenance <i>M</i> (<i>SD</i>)
Average Rubric Score	2.67 (0.93)	3.36 (0.93)	3.27 (1.07)	3.03 (1.07)

Test of the intervention effect. The between subjects main effect for the intervention was significant ($F(4, 16) = 3.150, p = 0.043$). However, univariate follow-up tests were not significant for the SSQ-% ($F(1, 19) = 2.445, p = 0.134$), the SWT ($F(1, 19) = .001, p = .973$), CWS ($F(1, 19) = 0.173, p = 0.682$), or the SWT-Rubric ($F(1, 19) = 1.652, p = .214$).

Exploratory analyses. Despite nonsignificant univariate main effects for the intervention and a nonsignificant multivariate interaction effect, a set of exploratory tests were

conducted for each of the dependent measures using a 2 x 4 repeated measures ANOVA. In addition, Hedges g effect sizes (ESs) were calculated on the gain score from the pretest to the posttest. Hedges g was used to account for the small sample size (Hedges, 1981). The results of the tests are indicated in Table 10.

Table 10

Overall Difference Between the Control and Treatment Groups for Each Measure

Dependent Measure	Testing the Overall Interaction Between Groups on the Pretest, Posttest, Delayed, and Maintenance Measure
Simple Sentence Quiz	$F(1.975, 19) = 3.207, p = 0.052, ES = 0.808$
Sentence Writing Test-%	$F(2.680, 19) = 0.981, p = 0.402, ES = -0.191$
Sentence Writing Test-Rubric	$F(3, 19) = 1.894, p = 0.141, ES = 0.333$
Curriculum Base Measure-CWS	$F(3, 19) = 0.328, p = 0.805, ES = 0.168$

Note. Mauchly's Test of Sphericity was significant for the SSQ ($p = 0.00$) and the SWT-% ($p = 0.01$); therefore, the Huynh-Feldt (1976) correction was applied above.

This series of tests considers each dependent measure separately. The SSQ was the most proximal measure to the intervention and produced the highest effect size ($ES = 0.808$).

Although this finding was not significant, the relatively small p -value (0.052) indicates that the intervention did have a potentially positive influence on the simple sentence writing knowledge for students in the treatment group. The other three measures were not directly related to the intervention, and as a result, no statistical differences were seen on the SWT-%, the SWT-Rubric, or the WE-CBM: CWS.

In addition to exploring the effect of the intervention statistically, the means for each dependent measure were plotted for each time administered and the differences between the treatment and control group were examined. Figure 5 displays the graph for the SSQ. Results indicate that students in the treatment group performed better, although not statistically significantly better, on the SSQ than the control group on the posttest, the delayed test, and the maintenance test.

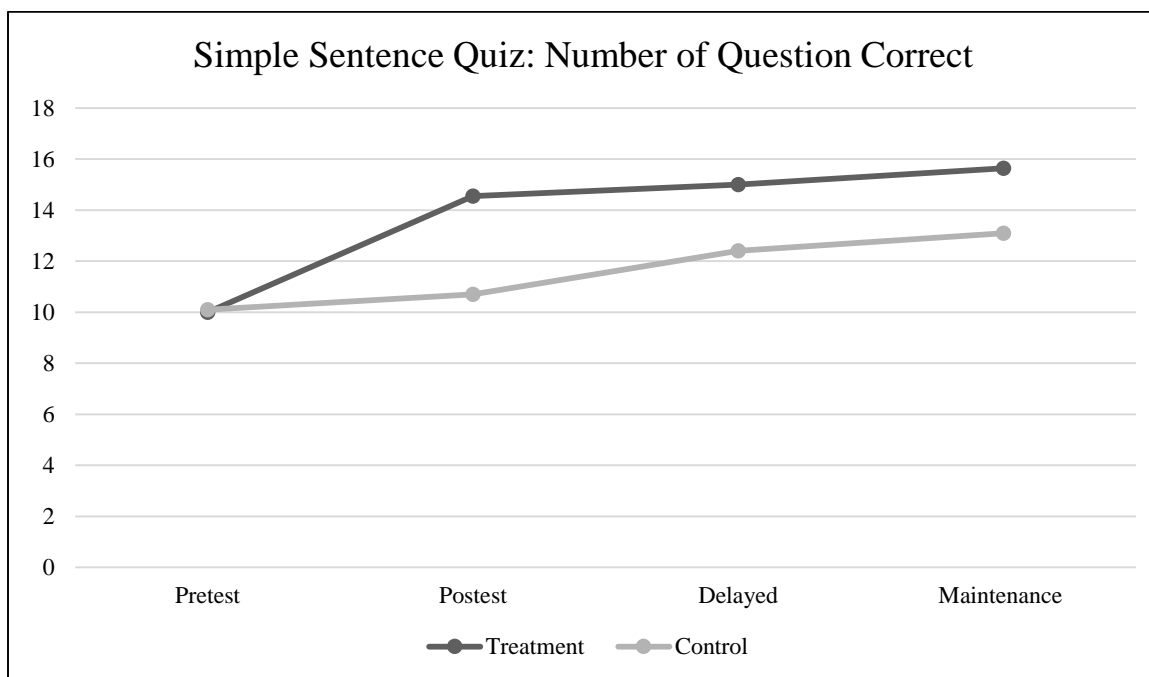


Figure 5. Sentence Writing Quiz

The SSQ was the most proximal measure whereas the other three measures (SWT-%, SWT-Rubric, WE-CBM: CWS) were not as closely aligned to the intervention. Although there was not a statistical difference between the treatment group and control group on the SWT-% ($F[1, 19] = .128; p = .724$) prior to the intervention, as indicated in Figure 6, students in the treatment group had a higher percentage of non-sentences on average on the SWT compared to students in the control group on the pretest measure (treatment: $M = 65.66, SD = 36.37$; control: $M = 60.75, SD = 24.53$). Students in both the treatment group and the control group decreased their average number of non-sentences written on the SWT-% between the pretest and the posttest (treatment posttest: $M = 41.12, SD = 33.28$; control posttest: $M = 34.60, SD = 25.77$), but it was not until the delayed test that the students in the treatment group performed better (treatment delayed test: $M = 34.26, SD = 33.11$; control delayed test: $M = 46.32, SD = 26.87$). Figure 6 indicates this relation.

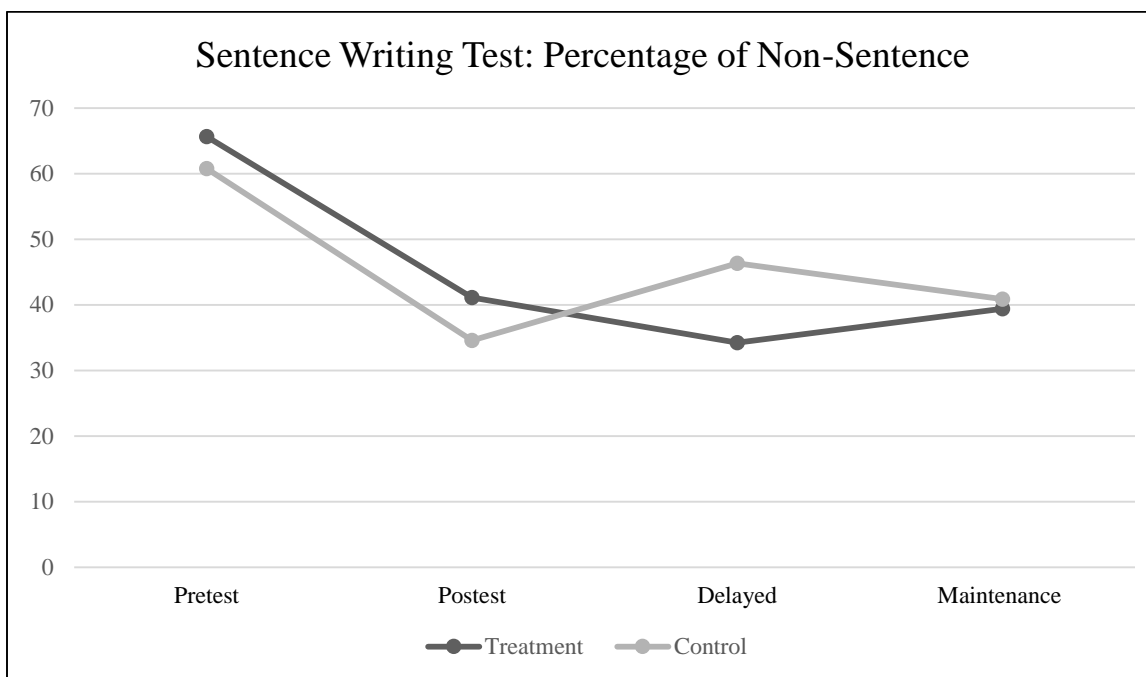


Figure 6. Sentence Writing Test

Figure 7 displays the mean scores obtained from the average number of points obtained for each student on the *6-Trait* (Spandel, 2008) writing rubric. The rubric looked at six different categories: ideas; word choice; organization; sentence fluency; voice; and conventions and layout. The average score for both the treatment and the control group for each category is reported in the appendix (see Appendix F). For the MANOVA and the ANOVA analyses, the SWT-Rubric score was the mean score a student received for the six components analyzed. The means and standard deviations for each component are reported in Appendix F.

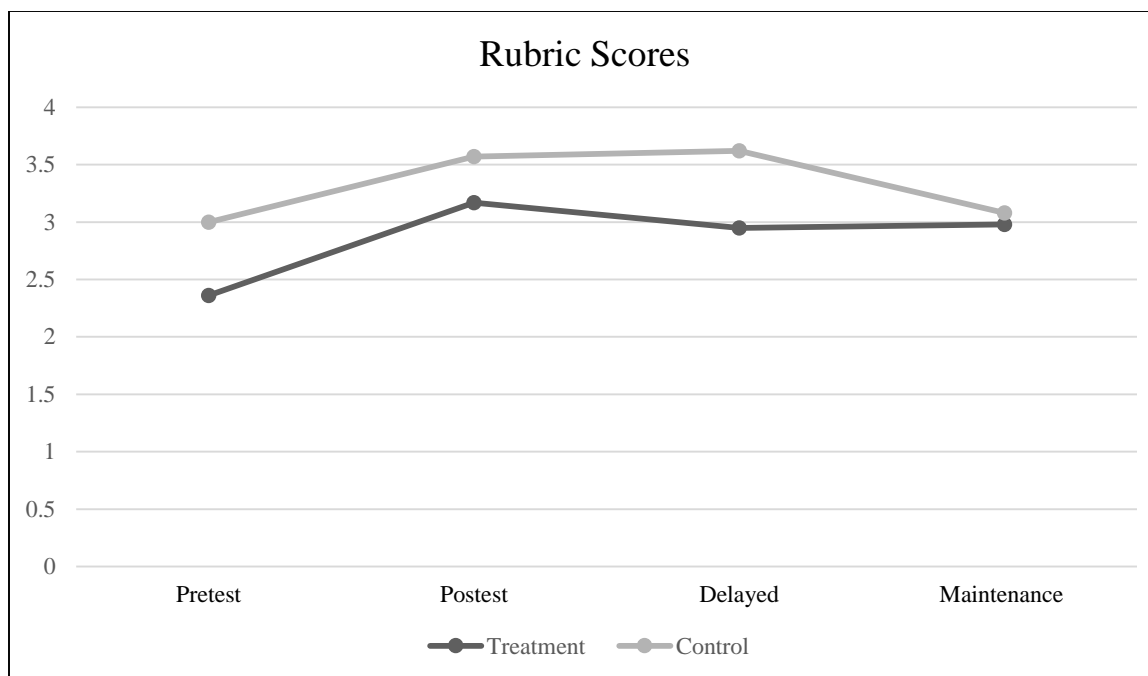


Figure 7. Rubric Scores

Figure 8 displays the average number of correct word sequences written by students in the treatment group and the control group during each testing time. Similar to the SWT-% and the SWT-Rubric scores, students in the control group produced on average more CWS than students in the treatment group. When considering the growth from the pretest to the posttest, students in the treatment group produced on average 2.54 more correct writing sequences per 3 min WE-CBM writing sample. Students in the control group produced an average of 0.3 more CWS. Having to choose one metric for the statistical model, the number of CWS was used based on the recommendations by Hosp et al., (2014). Scores analyzing the number of total words written, words spelled correctly, incorrect writing sequences, and correct minus incorrect writing sequences are reported in Appendix G.

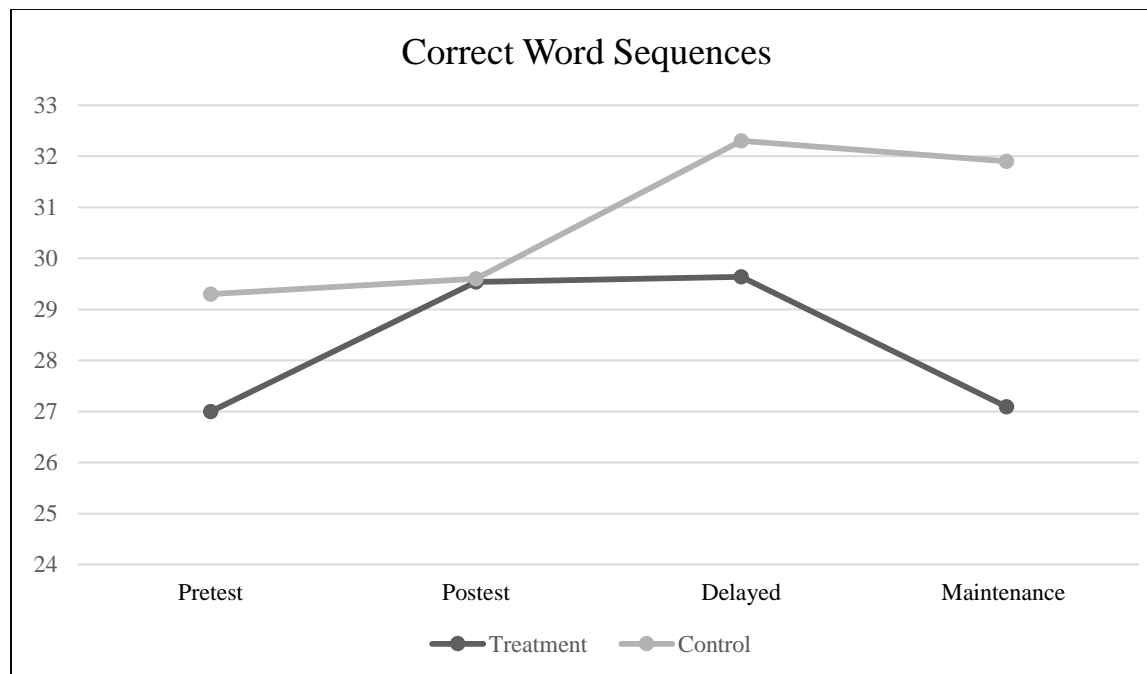


Figure 8. Correct Word Sequences

CHAPTER 5

DISCUSSION

This study demonstrated that part I of the *Proficiency in Sentence Writing Strategy* (Schumaker & Sheldon, 1999) can have a positive impact on students' with intellectual disabilities (ID) understanding of simple sentences, which may influence students' overall writing ability. It is unfortunate that the multivariate analysis of variance (MANOVA) did not reveal a significant interaction. A significant main effect for the intervention was found; however, follow-up tests for each measure were not significant. Therefore, post-hoc analyses were done for exploratory purposes. In addition, effect sizes (*ESs*) were calculated for each metric on the gain score (the difference from the pretest to the posttest).

The univariate main effect for time and three out of the four follow-up post-hoc comparison tests were significant. This finding indicated that students' overall performance changed from the pretest to the posttest, to the delayed test (compared to the pretest), and to the maintenance test (compared to the pretest). This was true for all measures except for the curriculum-based writing measure metric of correct word sequences (CWS).

Overall Interaction

To examine whether a change occurred in student writing performance between tests (pretest, posttest, delayed, and maintenance) and condition (treatment or control), a MANOVA was used. The analysis revealed the overall interaction was not significant ($F(1, 19) = 1.911, p = .182$). Therefore, I was unable to reject the null-hypothesis and concluded that the *Proficiency in the Sentence Writing Strategy* did not have a statistical impact on the dependent measures. The dependent measures included in the MANOVA were the following:

- 1) Simple Sentence Quiz (SSQ)
 - a. The percentage of correct answers on the 20 point assessment
- 2) Sentence Writing Test (SWT)
 - a. The percentage of non-sentences written (SWT-%)
 - b. The average rubric score for each student (SWT-Rubric)
- 3) Curriculum based measure for written expression: (WE-CBM)
 - a. The number of correct word sequences written: (CWS)

Main Effects: Time and Intervention

Time. The overall main effect of time was significant. To explore the within-subject time effect, post-hoc contrasts with paired comparisons made to the pretests were conducted. The results of these tests indicated there were significant overall changes in students' writing performance as measured by the SSQ, SWT-%, and SWT-Rubric over time. In general, students performed lower on the pretests than they did on the follow-up measures. For the SWT-%, students wrote fewer sentences incorrectly on the posttest, delayed, and maintenance measures compared to the pretest. Because improved academic performance is a goal for students attending the postsecondary education (PSE) program, this was a positive aspect—students in the program became better writers throughout the course of the semester.

The significant results of the main effect for time may have been influenced by practice effects. Students were required to write for all assessments. For the SWT and the WE-CBM measures, students had to generate their own responses after being given story starters. Also, the SSQ assessment lent itself to practice effects in the way in which the questions were worded. For instance, the first couple of questions required students to know what a subject, a verb, and an independent clause were (e.g., Which part of speech names what the sentence is about?).

Then in the subsequent questions, the first part of the question would state, “The subject of a sentence names the person, place, thing, quality, or idea the sentence is about.” This was stated directly before students were asked to underline the subject or subjects in the sentence.

Therefore, the question read, “The subject of a sentence names the person, place, thing, quality, or idea the sentence is about. Please underline the subject or subjects in the sentence below.”

Although, the questions for the delayed, and maintenance exams were changed slightly to help control for practice effects, the amount of change was minimal (e.g., The sentence “Jane ran to the store.” was changed to “Bill walked from home.”). In addition, the proximity in time of the delayed and maintenance tests to one another may have contributed to the degree in which practice effects occurred.

Intervention. The main effects of the intervention were tested using a repeated measures ANOVA, which was significant. However, additional between subject follow-up tests, revealed nonsignificant findings for each of the four metrics. In lieu of these findings, exploratory 2x4 ANOVAs were ran for each metric and *ESs* were calculated.

ANOVA findings. The ANOVA results and the *ES* were reported in Table 10 (see CHAPTER 4). Findings were reported for each of the metrics. Although the findings for the analyses were not significant, the *ESs* indices indicate the intervention had the greatest impact on the most proximal measure, the SSQ ($ES = .808$). Effect sizes for the SWT-Rubric and for WE-CBM: CWS indicated a small effect in favor of the treatment group, but for the SWT-% the *ES* indicated a small effect in favor of the control group.

Comparison to Previous Research

This study used part I of *The Proficiency in Sentence Writing Strategy* to teach students attending a postsecondary program a simple sentence writing technique. This strategy is part of

the *Learning Strategies Curriculum*, which has been successfully used to increase the writing proficiency of students with ID attending a PSE program (Woods-Groves et al., 2012a; 2012b; 2014; 2015). Woods-Groves and colleagues reported significant results for strategy acquisition and for improved rubric scores for students in the treatment group who received instruction in the *Essay Test-Taking Strategy* (Woods-Groves et al., 2014) and the *EDIT Strategy* (Woods-Groves et al., 2015).

No published studies were located that examined the sole impact of *The Proficiency in Sentence Writing Strategy*. However, prior to the strategy being commercially published, Schmidt et al. (1989) showed that grammar instruction following the strategy's approach (in combination with paragraph writing, error monitoring, and theme writing instruction) can improve the quality of student's writing.

Sentence instruction, in general, has been shown to improve students' writing (Beals, 1983; Eads, 1991; First, 1994; Johnson, 2005). Studies have also demonstrated that sentence writing instruction is beneficial for students with ID (Rousseu et al., 1994; Yamamoto & Miya, 1999). Similar to Johnson (2005), this study found that students with ID can show improved conceptual knowledge of subjects and verbs, a skill needed in order to understand and use the simple sentence writing strategy. The understanding of simple sentence vocabulary terms and the application of these concepts comprised the majority of the intervention efforts. As with any of the programs from *Learning Strategies Curriculum*, the pacing of the instructional lessons can and should be adjusted to meet the instructional needs of the students. For this study, the number of lessons needed to teach/reteach the simple sentence vocabulary knowledge was lengthened, placing the majority of the intervention's focus on teaching students to correctly define subjects and verbs and how to locate subjects and verbs in given sentences. This adjustment in pacing

made this study and that of Johnson (2005) quite similar. Once intervention students mastered these concepts, they were taught how to use the mnemonic PENS to create their own sentences (e.g., SV, SSV, SVV, and SSVV). When the intervention ended, all students had mastered the technique (i.e., reached a criterion of 80% [students correctly constructed 8 out of 10 sentences using a given formula on an independent practice worksheet]). The generalization phase of the strategy was not taught due to time constraints (the end of the semester). The purpose of the strategy's generalization phase is to discuss the rationale and importance of using the strategy in a variety of settings. Research indicates the importance of explicitly teaching students with ID how to use instructional strategies in a variety of settings (O'Reilly, Lancioni, & Kierans, 2000). Therefore, it was not surprising that only one student demonstrated using the strategy on the post-test assessment (i.e., student underlined the subjects and verbs and wrote out the corresponding formula). Whereas this study used part I of the *Proficiency in Sentence Writing Strategy* for the intervention, Johnson (2005) taught an intervention designed to target prerequisite simple sentence skills following the *Sentence Writing Preskills* curriculum (Glaeser, 1990). Students in the Johnson study were first taught to use the acronym ACTION to identify the subject and verbs in sentences, and they were taught how to use the four simple sentence formulas to write correct simple sentences.

Comparing the studies, the Johnson (2005) study showed significant growth on one standardized measure (Writing Fluency Subtest of the Woodcock-Johnson III Test of Achievement); however, no improvement was found for students on the second standardized measure (Comprehensive Inventory of Basic Skills–Revised). I also found no improvement for students in the treatment groups on the more distal measures. The most proximal measure for the Johnson (2005) study required students to identify the subject and verbs in a set of given

sentences. Following the intervention, students were able to identify the grammar elements with 75% accuracy. In addition to the subject and verb assessment, Johnson (2005) also had students use the four simple sentence formulas (the same formulas taught in the *Proficiency in Sentence Writing Strategy*) to generate their own sentences. The data reported from this measure indicated that 10 students reached mastery of the strategy (scoring 80% or higher), three students scored the same, and three students performed worse on this assessment following the intervention. In my study, students' understanding of subjects and verbs was measured by the SSQ, which produced the highest effect size ($ES = 0.808$). However, this measure did not demonstrate students' use of the mnemonic PENS. Another similar finding was that Johnson (2005) also used the *Proficiency in Sentence Writing* test (the SWT) as a dependent measure. Johnson reported similar results, indicating that students increased from writing 38.92% of sentences correctly prior to the intervention and to writing 71.19% of sentences correctly following the intervention. Johnson (2005) reported that her study replicated the results of Schmidt et al. (1989); although, as indicated in CHAPTER 2, Schmidt et al. (1989) included a treatment package that combined multiple writing strategies. Therefore, this study extended the findings reported in Johnson (2005) for postsecondary students with ID.

Implications

Results from this research study indicate that students with ID attending a PSE can acquire the prerequisite skills needed for advanced sentence writing instruction. Pretest data and previous research studies (Rousseu et al., 1994; Yamamoto & Miya, 1999; Young et al., 2004) have indicated that adult students with ID lack proficiency with sentence writing. For students with intellectual needs, direct instruction in writing needs to take place throughout a student's educational career. As more students with ID attend PSE programs, the opportunity for students

to receive effective writing instruction continues to expand. Research indicates that PSE students with ID can benefit from writing instruction (Woods-Groves et al., 2012a, 2012b, 2014, 2015), and this study supports these findings.

Effective writing instruction is important for all students at any grade-level, but for students attending institutes of higher education (IHE), writing is one of the most important skills students need to master prior to graduation (NCW, 2004).

The ability to be able to write well is imperative (NCW, 2005). It is important not only in the educational setting but also in a professional setting as well (Graham & Fitzgerald, 2006). Upon graduation from PSE, many students will apply for jobs. Simply filling out a job application, not to mention writing an application letter and résumé, requires proficient writing skills. In addition, employers expect employees to be able to communicate effectively and many times that communication comes in the form of writing.

Sentence writing is seen as a prerequisite skill to higher order writing interventions such as essay writing or editing. This study demonstrated that the majority of the students in the study were not able to write complete sentences with proficiency prior to the intervention. Furthermore as described in CHAPTER 2, research supports that students with special needs benefit from instruction in sentence writing because students with ID often have deficits in writing that stem from linguistic deficits (Berninger et al., 1991). Such students have difficulty rearranging letters to spell words, rearranging words to make complete sentences, or rearranging sentences to form paragraphs (Berninger et al., 1991).

Limitations

One of the biggest limitations of this study was the lack of power. This is not uncommon to the field of special education where sample populations are small. For this study, 21 students

matched the inclusion criteria. These selected students were randomly assigned to either the treatment or control condition. A post-hoc power-analysis using 21 students revealed that the study had a perceived power of .18 to detect a minimal effect (i.e., 10% change on a given dependent measure) indicating there was 18% chance of obtaining a statistically significant result at an alpha level of .05.

In addition to the lack of power, another limitation was the difficulty in controlling for writing practice. Although students in the control group did not receive direct writing instruction during the class period while students in the treatment group received this intervention, they were required to write (e.g., create a PowerPoint presentation). In addition, diffusion of treatment could have taken place because students from the treatment group interacted and took classes with students in the control group throughout the week. Thus, students in the control group became aware of what was being taught in the experimental condition. This factor may have also contributed to the lack of significance in this study, especially when considering the limitation of power.

A third limitation, common to the field of writing research, was the strength of the dependent measures chosen. Assessing students' writing growth is a critical aspect of writing research. However, it is difficult to use only standardized, reliable, and valid writing measures because such broad measures, such as the WE-CBM, do not capture the transfer of specific intervention skills. Instead, these measures indicate overall writing progress. In this study, three of the four measures that were chosen for the MANOVA lacked technical adequacy data even though these measures provided data on the specific skills targeted in the intervention. Conversely, the intervention had unforeseen benefits (such as creating a common language to use when discussing writing) that were not able to be captured by the chosen measures.

Last, the way in which the data were reported for the SWT may have contributed to the non-significant MANOVA interaction. For the SWT, the percentages of non-sentences were used, and unlike the other measures, the number of non-sentences produced by students decreased. Although this was the desirable outcome, the direction of the change was not the same as the other measures. This may have confounded the findings.

Considerations and Future Research

Before students can become fluent with simple sentence writing, it is imperative that they understand the associated prerequisite vocabulary. Critical terms that students needed to know for this intervention included subject, verb, helping verb, linking verb, simple sentence, and independent clause. These concepts were explicitly addressed in part I of the *Proficiency of Sentence Writing* curriculum. However, to maintain mastery, students in the treatment group needed to have each concept explicitly taught over multiple intervention days. In addition, there were grammar concepts such as “prepositional phrase” that students needed to be familiar with that were not taught in this program. Future research should consider such terms because students tended to identify the object of the preposition as the subject of the sentence and without understanding of terms like “direct object,” addressing common student mistakes was difficult.

This adjustment in instructional pacing placed the focus of the intervention on teaching students the concepts surrounding simple sentence writing. These findings are evident in students’ progress on the SSQ ($ES = 0.808$). Due to the time needed to teach these concepts, less time was devoted to students understanding and application of the PENS strategy. (To use the strategy students need to be able to **P**ick a formula [SV, SVV, SSV, or SSVV], which requires that they have a firm understanding of what constitutes a subject and what constitutes a verb.) One solution to teaching the prerequisite skills needed for the intervention would be to use *The*

Fundamentals in Sentence Writing Strategy (Sheldon et al., 1998) or the *Sentence Writing Preskills* (Glaeser, 1990). However, future research is needed to determine the efficacy of these programs.

Moving forward, more research is also needed to support the use of the *Proficiency in Sentence Writing* for students with ID attending PSE. Although the intervention was aligned to the needs of the students, future studies should plan for more time to develop the prerequisite skills required for the intervention. Also, time should be devoted to explicitly teaching the generalization phases of the strategy, and dependent measures should continue to examine the impact of simple sentence strategy instruction on students' overall writing quality. Dependent measures should also examine social validity, which was not systematically done in this study. In conjunction with monitoring social validity, future research should also consider how and if student motivation contributes to writing outcomes.

Once students have mastered writing simple sentences as demonstrated by generalization, future research should look at the additional parts of the *Proficiency in Sentence Writing* program that teaches compound sentences, complex sentences, and compound-complex sentences.

Future research should continue to examine how writing is measured and scored. In this study, a large amount of time and consideration was devoted to accurately scoring the writing samples. The SSQ was the easiest assessment to score because it consisted of 20 fill-in-the-blank and/or circle correct word in the sentence type of test. The SWT-% was more difficult to score because it required that scorers have a solid understanding of the different types of sentences and the nuances that distinguishes one type of sentence from another. When the SWT-Rubric assessments were scored with the writing rubric, numerous discussions and references to the scored writing samples to ensure scoring accuracy. Furthermore, scoring the WE-CBM was

extremely labor intensive, and although the scoring rules were explicitly laid out, there were situations where the scorers were forced to make a decision regarding how a particular situation should be handled. Even though CWS as measured by WE-CBM probes has been found to be a reliable and valid measure to use, the time needed to score each writing sample may detract from the usefulness of the measure. Future research should consider whether a metric such as the number of correct punctuation marks, which would take less time to score and would produce more reliable results, is a valid measure of students overall writing ability.

Conclusion

Postsecondary students with ID often lack proficiency with sentence writing (Young et al., 2004). To target this deficit, students need to be explicitly taught a variety of sentence writing strategies. Strategic Instruction Model (SIM) is a proven instructional approach to teaching postsecondary students with ID (Woods-Groves et al., 2012a; 2012b; 2014; 2015) but has yet to be used to teach students sentence writing strategies. The *Proficiency in Sentence Writing Strategy* follows the SIM instructional technique for teaching students a variety of sentence structures (simple, compound, complex, and compound-complex). Students in this study were taught using part I of the *Proficiency in Sentence Writing Strategy*, which focuses on simple sentence writing. The majority of the instructional time in this intervention was spent teaching students the prerequisite vocabulary and concept understanding needed for them to use the PENS mnemonic to **P**ick a formula, **E**xplore words to fit the formula, **N**ote the words, and **S**earch and check. The vocabulary terms that students were taught were subject, verb, helping verb, linking verb, independent clause, and simple sentence. Students in the treatment group were able to demonstrate their understanding of these terms on the SSQ ($ES = 0.808$). Half of the 16 instructional sessions were spent helping students develop this background knowledge;

therefore, with 2 instructional days for the introduction and buy-in to the strategy, only six lessons devoted to teaching students the mnemonic and having them practice using the strategy. Due to time constraints, the generalization phase of this strategy was not explicitly taught, and students did not have the opportunity to practice this strategy on a variety of writing tasks. The findings from this study coincide with where the instructional focus was placed. Large effects were seen on the measure that demonstrated students' fluency with simple sentence terminology and small to no effects were seen on measures that examined the generalization of the strategy to other writing assignments.

Appendix A
Treatment Integrity Sheets

Instructor: E. Kaldenberg

Observer:

Time:

Date: 10/1/2013

Intervention Day 4

Directions: Place an X on the blank once the instructional activity has been completed. If the instructional activity has not been completed, do not write anything on the blank.

- I. Advanced organizer: _____

- II. Review
 - a. Simple Sentences: _____
 - b. Independent Clause: _____
 - c. Subjects: _____
 - d. Nouns: _____
 - e. Verbs: _____

- III. Introduced linking verbs: _____

- IV. Verb-Subject Identification: _____
 - a. Describe Step 1: _____
 - b. Describe Step 2: _____

- V. Guided Practice: _____

- VI. Independent Practice: _____

- VII. Closing and Advanced Organizer: _____

Appendix B
List of WE-CBM Prompts

WE-CBM Directions taken from Hosp, Hosp, and Howell (2007)

Today, I want you to write a story. I am going to read a sentence to you first and then I want you to compose a short story about what happens. You will have 1 minute to think about what you will write and 3 minutes to write your story. Remember to do your best work. But don't worry about it. We just want you to do your best writing, and remember, this story is not graded. If you don't know how to spell a word, you should guess. Are there any questions?

Put your pencils down and listen. For the next minute think about... (START TIMER 1 MINUTE)

[After 30 seconds] You should be thinking about...(READ WRITING PROMPT)

[At the end of 1 minute, restart your stopwatch for 3 minutes and say] **Now begin writing.**

[At the end of 3 minutes say] **Please stop writing. Thank you.**

WE-CBM Writing Prompts taken from Hosp, Hosp, and Howell (2007)

Pretest Prompts

Prompt 1: *If I could fly, I would go...*

Prompt 2: *The best vacation I ever had was...*

Prompt 3: *The dog jumped over the fence and..*

Posttest Prompt

Prompt 1: *The best part of school is...*

Prompt 2: *Today I woke up and...*

Prompt 3: *When I was flying on a magic carpet...*

Delayed Prompt

Prompt : *On my way home from school I found a...*

Maintenance Prompt

Prompt: *I looked out my window and to my surprise...*

Appendix C

How to Calculate Incorrect Word Sequences

Step 1:

Calculate correct word sequences by placing a caret ^ between two adjacent words that are correctly spelled and follow correct punctuation, grammar, syntax and semantics rules. In addition, place a caret before a correct ending punctuation mark and the ending punctuation mark and the beginning of the next sentence if proper capitalization is used (Hosp, Hosp, & Howell, 2003).

Step 2:

Calculate incorrect word sequence by placing a dot (●) between two adjacent words that do not qualify as a correct word sequence.

Scoring Sample

Correct Word Sequences	Incorrect Word Sequences	
9	2	^ On ^ my ^ way ^ home ^ from ● skool ● I ^ found ^ a ^ hundred ^
9	2	dollar ● Bill ● on ^ the ^ ground ^.^ I ^ picked ^ it ^ up ^ and ^
12	1	kept ^ it ^ so ^ no ^ one ● take ^ it ^ from ^ me ^.^ I ^ went ^ into ^
10	0	the ^ bank ^ to ^ deposit ^ it ^ so ^ I ^ could ^ have ^ more ^
9	1	money ^ in ^ my ^ account ● I ^ want ^ more ^ money ^ so ^ I ^
5	2	can ^ go ^ shopping ^ and ● by ● new ^ clothes ^.

Total correct word sequences: 54

Total incorrect word sequences: 8

Appendix D
Researcher Created Guided Notes

Cue Card #1 Guided Notes

Name: _____

Date: _____

SIMPLE SENTENCE

A sentence that has one _____.

Example: Jane walks fast.

Example: _____.

INDEPENDENT CLAUSE

A group of words that

1) makes a complete statement

2) has a _____ and a _____.

Appendix E
Mauchly's Test of Sphericity

Within Subjects Effect	Measure	Mauchly's W	Approx. Chi Square	df	Sig.	Greenhouse- Geisser	Huynh- Feldt	Lower- Bound
	SSQ	.284	22.325	5	.000	.573	.658	.333
	SWT	.425	15.165	5	.010	.745	.893	.333
	CWS	.649	7.660	5	.177	.776	.937	.333
	Rubric	.666	7.209	5	.206	.806	.981	.333

Appendix F
Rubric Scores: Ideas, Word Choice, Organization, Sentence Fluency, Voice, and Conventions

	Ideas	Word Choice	Organization	Sentence Fluency	Voice	Conventions
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Pretest						
Treatment	3.17 (0.81)	2.27 (0.79)	2.18 (0.87)	2.36 (0.92)	2.27 (0.67)	2.73 (1.29)
Control	2.90 (0.82)	3.00 (0.82)	2.60 (0.95)	2.90 (0.74)	3.40 (0.95)	3.00 (0.99)
Posttest						
Treatment	3.09 (0.79)	3.09 (0.83)	3.09 (1.04)	3.18 (0.98)	3.00 (0.77)	3.36 (1.29)
Control	3.80 (0.82)	3.70 (0.84)	3.70 (0.84)	3.30 (0.82)	3.70 (0.97)	3.70 (1.07)
Delayed						
Treatment	3.09 (1.17)	3.00 (1.34)	3.09 (1.10)	2.91 (0.94)	2.64 (1.10)	3.00 (1.22)
Control	4.00 (0.88)	3.90 (0.67)	3.80 (0.95)	3.40 (0.95)	3.80 (1.07)	3.80 (1.08)
Maintenance						
Treatment	3.27 (1.12)	3.36 (1.29)	3.09 (1.14)	2.73 (1.04)	2.82 (1.10)	2.64 (1.29)
Control	3.50 (1.06)	3.60 (0.85)	3.20 (0.82)	2.70 (0.84)	3.60 (0.97)	2.70 (0.97)

Appendix G
Additional WE-CBM Data

	TWW	WSC	IWS	CWS-IWS
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Pretest				
Treatment	32.55 (14.73)	30.27 (15.02)	8.18 (6.74)	17.73 (21.65)
Control	36.50 (8.92)	34.30 (9.15)	12.20 (8.56)	17.90 (13.12)
Posttest				
Treatment	37.82 (12.03)	35.09 (13.33)	11.18 (8.17)	17.55 (17.49)
Control	36.70 (16.19)	34.80 (14.97)	10.00 (5.94)	19.80 (11.90)
Delayed				
Treatment	34.00 (13.59)	32.82 (14.39)	8.82 (7.96)	20.82 (19.55)
Control	40.78 (15.11)	39.22 (15.43)	12.67 (10.44)	19.56 (25.05)
Maint.				
Treatment	33.27 (15.44)	30.73 (16.47)	11.09 (7.92)	17.09 (23.21)
Control	37.50 (9.20)	35.90 (8.85)	9.20 (7.48)	22.70 (14.15)

Note: TWW= total words written; WSC = words spelled correctly; IWS = incorrect word sequences; CWS-IWS = correct word sequences minus incorrect word sequences.

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