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The Impact of Self-Regulated Strategy Development on Upper Elementary Students' Opinion Writing Performance

Michelle R. Popham
Clemson University, michellepopham@yahoo.com

THE IMPACT OF SELF-REGULATED STRATEGY DEVELOPMENT ON UPPER ELEMENTARY STUDENTS' OPINION WRITING PERFORMANCE

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Michelle Rogers Popham
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Accepted by:
Dr. Janie Hodge, committee Chair
Dr. Hans Klar
Dr. Meihua Qian
Dr. Pamela Stecker

Abstract

The primary purpose of this study was to examine the effects of SRSD opinion writing instruction provided by teachers who completed SRSD Writing to Learn™ online training on the writing performance of students with and without specific learning disabilities (SLD) in third, fourth, and fifth grade. A secondary purpose of the study was to determine teachers' perceptions of SRSD Writing to Learn™ online training and the impact of the training on their knowledge of SRSD. A pretest-postest, cluster randomized control design was used to determine the effects of SRSD opinion writing instruction, following teachers' completion of SRSD Writing to Learn™ training, on students' writing achievement. Differential effects for students with SLD and student acceptability of instruction were also examined. Results indicated that students in experimental classes wrote longer essays that contained more elements of opinion essays compared to students in comparison classes. While students with SLD performed below their typically performing peers on measures of elements and length of writing samples, students with SLD in the comparison group wrote longer essays that contained more elements of opinion essays compared to students with SLD in comparison classrooms. Students provided generally positive responses regarding questions of acceptability.

To address the secondary purpose of the study, teachers' content knowledge of SRSD was measured, and teachers' provided feedback regarding their perceptions of the online training. Results indicated that after completion of SRSD Writing to Learn™ training and implementation of SRSD instruction with moderate to high levels of fidelity, teachers were able to identify some stages of SRSD and the corresponding instructional

components of each stage. Teachers generally reported positive perceptions of the online training. They found the training modules to be applicable and relevant, although they found the information to be somewhat overwhelming and difficult to navigate. A discussion of results addresses limitations of the study, implications for practice, and directions future research. While the results of the study demonstrate that teachers who have completed online training are able to implement SRSD and positively impact opinion writing performance for upper elementary students with and without SLD, specific consideration should be given to the differential effects for students with SLD. When providing SRSD instruction in the general education setting, all students' needs should be considered. Struggling writers, and specifically those with SLD, will likely require more intensive instruction. Differentiating instruction within the general education setting and supplementing and intensifying instruction in intervention or special education settings may allow students with SLD to benefit even more from instruction within an SRSD framework.

Dedication

To my father, Mike Rogers, who encouraged me to follow my dreams and never give up.

and

To my sons, Cole Popham and Kaeden Popham, who have given me joy, laughter, and a reason to persist when faced with difficulties.

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Chapter 1

Introduction

Writing is a learning and communication skill that is not only important for success in school but is also critical for post-school success. Students are required to use writing as a tool to demonstrate what they have learned across the curriculum (Graham & Hebert, 2010; Graham & Perin, 2007b). Writing remains an essential skill beyond high school. College entrance requirements often rely on student writing samples, and students are expected to write in college classes; however, students are often underprepared for the requirements of college-level writing. Of students who took the 2017 ACT writing assessment, which is based on core writing competencies required for college success, only 61% met college and career readiness benchmarks (ACT, Inc., 2017). Furthermore, colleges often provide remedial writing classes to help college students gain the writing skills that they lack (Harris & Graham, 2016). The effect of unpreparedness for writing also manifests in the workplace setting exemplified by expenditures of businesses at 3.1 billion dollars annually for remediation of writing (National Commission on Writing, 2006).

Although the ability to communicate effectively in writing is critical for both school outcomes and post-school outcomes, many students struggle to meet grade-level expectations for writing. According to results of the National Assessment of Educational Progress (NAEP) (National Center for Education Statistics, 2012) about 70% of students in 8th grade and 12th grade performed below the proficient level writing. While the NAEP assessment was administered again in 2017, results of that assessment are not yet

published. Students with disabilities (SWD) fared worse with 95% in 8th and 12th grades scoring below the proficient level (National Center for Education Statistics, 2012). The writing outcomes of students represented by ACT scores, college remedial classes, business expenditures for remediation of writing, and the NAEP writing assessment results from 8th and 12th grade students indicate the continued need for effective instruction and intervention in writing for all students. Improvement of students' writing skills at the elementary level has the potential to improve writing outcomes beyond elementary school.

Opinion Writing to Support College and Career Readiness

All states in the U. S. have adopted College and Career Ready (CCR) standards which aim to provide students with the knowledge and skills to qualify for, and succeed in, postsecondary coursework or to succeed in the postsecondary job training necessary for a chosen career (Achieve, 2015). In addition, many states have adopted Common Core State Standards (CCSS) CCR (Common Core State Standards Initiative, 2018). The first CCSS CCR anchor standard for English language arts is that students will write arguments to support claims. A foundational standard to argumentative writing is opinion writing, which appears in the CCSS beginning in kindergarten. According to the CCSS, students in grades kindergarten through fifth grade are required to compose opinion pieces. Standards that are specific to the upper elementary grades (e.g., Grades 4 and 5) specify that students write opinion pieces supporting a point of view with reasons and information (CCSS, 2018).

Writing Challenges for Students with Learning Disabilities

Effective instruction to support college and career readiness is essential for all students; however, SWD often experience challenges in writing that require more intensive intervention to impact students' writing abilities. Students with specific learning disabilities (SLD) make up 39% of SWD who receive services under the Individuals with Disabilities Education Act and 70% of students with SLD spend 80% or more of their day in the general education setting (U.S. Department of Education, 2018). It is likely that many students with SLD receive writing instruction in the general education setting. Therefore, it is critical that general education teachers are knowledgeable of instructional strategies to address writing skills and needs specific to students with SLD, as well as students without disabilities.

Writing difficulties faced by students with SLD may be due to a variety of factors. Writing is a complex task that requires students to engage in a variety of activities that often take place concurrently, such as composing, physically writing, spelling words correctly, and adhering to grammar rules (Graham, Harris, & McKeown, 2013). Students with SLD often have deficits in working memory, and when faced with cognitively demanding tasks such as writing, excessive demands are placed on the students' working memory (Swanson & Zheng, 2013). These deficits can affect writing by impeding students' retrieval of information needed from memory, such as information to include in the writing or spelling and grammar rules (Graham & Harris, 2003; Swanson & Zheng, 2013). Furthermore, students with SLD may have difficulty applying cognitive strategies to coordinate the planning strategies involved in writing (Bui, Schumaker, & Deshler,

2006; Graham & Harris, 2003; Graham, Harris, & Mason, 2005). Deficits in phonological awareness in reading may impede basic writing skills, such as generating and transcribing text, which are the foundation of other components of writing (i.e., planning, revising, editing) (Ahmed, Wagner, & Lopez, 2014; Graham & Harris, 2003). Often revisions to their writing made by students with SLD involve changes in spelling, grammar, and mechanics rather than changes to the content (Graham, MacArthur, & Schwartz, 1995; Graham, Kiuhara, Harris, & Fishman, 2017). Students with SLD often experience low motivation to write. One reason for lessened motivation may be that many students with SLD do not perceive writing as being valuable, or they may not comprehend the purpose for writing (Graham, Schwartz, & MacArthur, 1993; Saddler & Graham, 2007). Another factor that impacts motivation is students' attitudes toward writing. Students with SLD may have negative attitudes toward writing or low self-efficacy for writing, both of which are associated with decreased competence in writing (Graham, Berninger, & Fran, 2007).

Challenges in writing faced by students with SLD are well documented in the literature. For example, Gillespie and Graham (2014) conducted a meta-analysis of 53 studies, including students in grades 1 through 12, to compare the writing performance of students with SLD to typically developing peers. Specific characteristics of writing that were examined include written products, text production skills, self-regulation strategies, writing knowledge, and writing motivation. Results showed that students with SLD performed significantly lower than typically developing peers on all components of writing characteristics that were examined including: (a) writing quality, (b) writing

output, (c) genre elements, (d) ideation, (e) organization, (f) vocabulary, (g) voice, (h) conventions, (i) motivation, (j) self-regulation, and (k) knowledge. Findings of the - analysis support that students with SLD experience challenges with writing that are apparent across grade levels and impact the content of students' writing, what students know about writing, and how students feel about writing (Gillespie & Graham, 2014). Furthermore, assessment data (e.g., NAEP writing) suggest that students with and without disabilities do not perform at proficient levels in writing. Fortunately, research provides support for the use of specific evidence-based practices (EBP), to improve writing outcomes for students with and without SLD.

Self-regulated Strategy Development for Writing

One EBP for writing instruction that supports typically achieving students, struggling writers (e.g., at-risk for learning disabilities), and students with SLD (Baker, Chard, Ketterlin-Gellar, Apichatabutra, & Doabler, 2009; Graham et al., 2012b; What Works Clearinghouse (WWC), 2017) is self-regulated strategy development (SRSD) (Graham et al., 2012b). Simply stated, an EBP is a practice that has a research base that supports the effectiveness of the practice in affecting student outcomes (Cook & Odom, 2013). Both the Individuals with Disabilities Education Act (IDEA) (IDEA, 2004) and the Every Student Succeeds Act (ESSA, 2015) call for the use of EBPs. Regardless of legal mandates, the use of EBPs is important due to the potential to improve student outcomes.

Self-regulated strategy development is an instructional framework that combines explicit instruction, cognitive strategy instruction, and mnemonics to aid students in

remembering the steps to complete an academic task, such as writing an opinion essay. SRSD lessons include six stages of instruction that incorporate the self-regulation strategies of goal setting, self-monitoring, self-reinforcement, self-assessment, and self-instruction (Harris, Graham, Mason, & Friedlander, 2008). The six stages of instruction are: (a) develop and activate background knowledge, (b) discuss the strategy and introduce self-regulation procedures, (c) model the strategy, (d) memorize the strategy, (e) support the strategy through scaffolding, and (f) independent practice (Harris et al., 2008).

Research supports significant positive effects of SRSD instruction on writing outcomes, and as a result, SRSD is identified as an EBP for writing instruction for typically achieving students, struggling writers (e.g., at-risk for learning disabilities), and students with SLD (Baker et al., 2009; Graham et al., 2012b; What Works Clearinghouse (WWC), 2017). Three reports have documented SRSD as an EBP: (a) WWC, (b) U.S. IES Practice Guide, and (c) an independent researcher analysis (Baker et al., 2009). Furthermore, several meta-analyses indicate larger effects of SRSD instruction on students' writing performance than other types of writing instruction for students with SLD (Gillespie & Graham, 2014; Graham et al., 2013; Graham & Perin, 2007a, 2007b). While there is significant research supporting SRSD as an EBP, a recent meta-analysis reported relatively few studies focused on opinion or persuasive writing (Gillespie & Graham, 2014; Graham et al., 2013).

Importance of Professional Development for SRSD

Although SRSD is an EBP, it is not applied widely in school (Harris & Graham, 2016). Like many other EBPs, several issues affect the implementation of SRSD. For example, Cook and Odom (2013) described many factors that affect the implementation of EBPs including:(a) lack of attention given to how to implement them, (b) relevance to the school environment, (c) efficiency, (d) practicality, (e) training, and (f) available resources. Another factor that may account for the limited use of SRSD is inadequate teacher preparation for teaching writing. Many elementary teachers report that they are underprepared to teach writing and have limited PD opportunities for writing instruction (Gilbert & Graham, 2010). Many teachers have low self-efficacy toward writing (Brindle, Graham, Harris, & Hebert, 2016), and use EBPs infrequently (Applebee & Langer, 2011). For SRSD to be implemented and sustained, solutions to difficulties impacting implementation must be determined. One possible solution to challenges that account for the limited use of SRSD is to provide effective and sustained PD.

Because PD in teacher education is critical to ensure that teachers are equipped to implement EBPs (Cook & Odom, 2013), researchers have examined elements of PD that promote its effectiveness. Desimone (2009) provided a framework of critical components of high-quality PD that include: (a) content focused, (b) active learning, (c) coherence, (d) duration of 20 hours or more of contact time, and (e) collective participation. Similarly, in a review of 35 studies that support the link between teacher PD, teaching practices, and student outcomes, Darling-Hammond, Hyler, and Gardner (2017) identified seven features of effective PD that include: (a) content focused; (b)

incorporates active learning; (c) supports collaboration; (d) uses models of effective practice; (e) provides coaching and expert support; (f) offers feedback and reflection; and (g) is of sustained duration.

Practice-based professional development (PBPD) is one type of PD that incorporates several aspects of effective PD and has been effective to teach general education teachers to implement SRSD. Although PBPD includes a focus on content knowledge, a core component of PBPD is the application of the knowledge to practice teaching situations with the opportunity for peer and instructor feedback (Ball & Forzani, 2009). PBPD consists of six critical elements: (a) collaboration among teachers in the same school, (b) creation of PD based on learning needs of students in teachers' classrooms, (c) inclusion of content knowledge and pedagogical knowledge needed for teacher to successfully apply the teaching procedures, (d) application of new procedures through modeling and teacher practice, (e) use of materials during PD that are identical to materials to be used in the classroom, and (f) feedback provided to teachers as they practice and apply new teaching procedures (Harris et al., 2012b). Practice-based professional development offers many benefits to teachers including potentially increased self-efficacy, opportunities to practice instruction with peers, and support from an expert. Another advantage of PBPD for SRSD is that teachers are provided with opportunities to practice SRSD instruction with peers using materials that will be used to teach students (Harris et al., 2012b). When teachers practice teaching the strategy in the PBPD setting, instructors have the opportunity to coach and problem-solve before teachers implement the instruction with students (Ball & Forzani, 2009). PBPD embeds support for teachers

to implement a new practice which can impact the sustainability of the new technique (Desimone, 2011).

While many advantages of PBPD are evident, limitations of PBPD include expense, time, and physical location. Online professional development (OPD) offers a potential solution that circumvents issues of time and distance required by in-person PD (Dede, Ketelhut, Whitehouse, & McCloskey, 2009). OPD may be delivered in a format that allows individuals to participate at different times (asynchronously) through e-mail and discussion boards. Another format of OPD allows individuals to participate at the same time (synchronously) through chats and audio or video tools. Additionally, some OPD uses a combination synchronous, asynchronous, and in-person formats (U.S. Department of Education, 2010). OPD for SRSD is available from two developers, *SRSDOnline* and *thinkSRSD*. Although both programs are implemented broadly (Is SRSD in your region?, 2017; Results in Schools Supported by thinkSRSD, n.d.), no peer-reviewed research has been conducted to examine the impact of the programs on teachers' implementation of SRSD. Both programs were developed in collaboration with leading SRSD researchers and are delivered online. Advantages of OPD compared to in-person PD are flexibility of time and setting in which teachers participate in PD (Dede et al., 2009). For example, teachers who participate in OPD can complete OPD activities when their time permits. It may not be necessary for teachers to be assigned a substitute while teachers attend PD. Teachers who teach in rural areas may especially benefit from OPD by allowing opportunities for collaboration across districts (Gaumer Erickson, Noonan, & McCall, 2012; Russell, Carey, Kleiman, & Venable, 2009). In addition,

teachers who teach in specialized fields such as gifted or special education may be afforded the opportunity to collaborate with like educators, which may not otherwise be possible (Little & Housand, 2011). While OPD can be provided synchronously or asynchronously, each is flexible to include social interaction (Elliot, 2017). For example, teachers who participate in asynchronous OPD may collaborate with others through email or threaded forums (U.S. Department of Education, 2010), while those who participate synchronously may participate in chatrooms or audiovisual discussion (Elliot, 2017).

Conclusion

In summary, research supports that SRSD is effective for writing instruction for students ranging from typical developing students to students with disabilities in elementary through high school. A literature review of SRSD studies for opinion writing in the upper elementary grades reveals that fourth-grade students who are typically developing, struggling writers and SWD are not represented in the literature. Further research on the use of SRSD with this specific population as opinion writing is a skill which fourth-grade students are required to learn. PBPD is one type of PD that has evidence of efficacy; although there are some disadvantages associated with PBPD such as expenses, time to conduct training, and requirements of location. OPD is another type of professional development. Online professional development has evidence of efficacy for increasing teachers' knowledge and skills and on student academic achievement, but training length and online configuration vary in the literature. Furthermore, no research has addressed the use of OPD for SRSD. Research to investigate the impact of OPD for SRSD on teachers' knowledge of SRSD and writing content knowledge, teachers' ability

to implement SRSD following OPD, and student achievement following SRSD instruction is needed to determine whether OPD is an effective form of PD for SRSD.

Purpose of the Study

The primary purpose of this study was to determine the effects of SRSD instruction on the writing performance of upper elementary students with and without SLD whose teachers received SRSD Writing to Learn™ online training. Students' perceptions of the SRSD instruction was also assessed. A secondary purpose of this study was to determine how online professional development (SRSD Writing to Learn™ training) impacts upper elementary teachers' content knowledge of SRSD. Teacher acceptability of the online training was also assessed.

Research Questions

The following primary research questions were addressed at the student level:

1. What is the effect of SRSD writing instruction provided by upper elementary teachers who completed SRSD Writing to Learn™ online training compared to writing instruction by upper elementary teachers in a business-as-usual comparison group on students' writing achievement on opinion writing samples as measured by: (a) the number of genre elements included in students' opinion writing samples? and (b) the length of students' opinion writing samples.
2. What are the differential effects of SRSD instruction provided by upper elementary teachers who have completed SRSD Writing to Learn™ online training on writing performance (as measured by genre elements included, and

length of opinion writing samples) of students with learning disabilities compared to their non-disabled peers?

3. What are students' perceptions of the acceptability of SRSD instruction?

The following secondary questions are addressed at the teacher level:

1. Does SRSD Writing to Learn™ online professional development impact experimental teachers' knowledge of SRSD?
2. What are experimental teachers' perceptions of SRSD Writing to Learn™ online professional development?

Significance of the Study

Writing is a critical skill for school and post-school success, yet many students lack proficiency in writing when they leave high school. Struggling writers and students with SLD face challenges in writing that may be minimized if provided with evidence-based instruction. Students are expected to learn and write in the opinion writing genre, beginning in kindergarten. Opinion writing culminates as argumentative writing in the middle and high school grades; thus, mastery of opinion writing is foundational for success in argumentative writing.

Challenges that students face in writing may be addressed through the use of EBPs (e.g. SRSD). However, many factors, including limited training, may limit the use of EBPs. Self-regulated strategy development has been identified as an EBP; specific to SRSD, inadequate teacher preparation in writing often negatively affects implementation. Because EBPs, such as SRSD are critical for effective instruction, especially for struggling writers and students with SLD, problems of implementation should be

addressed.

One avenue to address challenges to implementation of EBPs is effective and sustained PD. Research supports the use of practice-based professional development (PBPD) to teach general education teachers to implement self-regulated strategy development (SRSD) for writing instruction. Teachers implement SRSD successfully after training, and students increase writing performance (Harris et al., 2012b; Mason et al., 2017; Rouse & Kiuhara, 2017). Studies have found PBPD to be effective; however, in-person training, such as PBPD, may present challenges to educators including expense, time constraints, and physical location. Mason et al. (2017) addressed some of the challenges of PBPD by decreasing training duration to one day and providing virtual consultation instead of in-person meetings. Online professional development also addresses many of the challenges of in-person professional development, such as minimizing issues of time and distance (Dede et al., 2009). Furthermore, research supports the use of OPD to increase teachers' abilities to implement instructional strategies and influence student achievement (Dash, de Kramer, O'Dwyer, Masters, & Russell, 2012; Fishman et al., 2013). OPD for SRSD is available from two developers, SRSDOnline and thinkSRSD. School districts across the nation have used the programs as teacher PD (Is SRSD in your region?, 2017; Results in Schools Supported by thinkSRSD, n.d.); however, there is a lack of peer-reviewed research to support the efficacy of the programs on student achievement or teacher knowledge and practice.

The study contributes to the literature by providing support for SRSD as an effective instructional framework to teach opinion writing to upper elementary students

who are in the general education setting (e.g. typically developing, struggling writers, SLD). The focus on opinion writing is significant because there are relatively few studies of SRSD to teach opinion writing to upper elementary students who are typically developing, struggling writers or SLD in the literature. Because opinion and persuasive writing requires the use of written language to analyze and discuss controversial views, opinion writing is a skill that develops more fully in the later grades (Nippold, Ward-Lonegran, & Fanning, 2005). However, students are expected to begin tasks related to opinion writing in kindergarten, and opinion writing is foundational to argumentative writing that students are expected to complete at the middle and high school level. The provision of effective instruction in opinion writing will not only benefit students while they are in elementary school, but will also provide a strong foundation for future writing tasks. Finally, additional support for SRSD instruction in opinion writing will increase generalizability of the research to settings not yet addressed in the literature.

In addition to determining the effects of SRSD instruction on upper elementary students' opinion writing, this study provides an increased understanding of OPD for influencing teachers' content knowledge and practice, as well as their acceptability of the OPD. Because OPD has the potential to reach more teachers than traditional PD due to the flexibility of the format, if teachers can positively impact students' writing, the possibility of providing OPD for SRSD to teachers on a larger scale may be warranted. This study provides a foundation for the continuation of research in OPD for SRSD. Furthermore, the application of these understandings may allow teachers to receive

training that is effective and possibly more feasible than face-to-face instruction, ultimately improving research-to-practice and increasing student writing achievement.

Chapter 2

Literature Review

The purpose of this chapter is to describe: (a) literature regarding self-regulated strategy development (SRSD) for opinion writing of upper elementary students and impact on writing outcomes for students; and (b) an examination of two approaches to professional development to support teachers' implementation of SRSD and other evidence-based practices. First, as an introduction to SRSD, a synthesis of meta-analyses that document the efficacy of SRSD is provided. Next, a systematic review of current literature that addresses SRSD for opinion and persuasive writing for students in upper elementary grades (e.g., 2-5) is described. The review of SRSD includes descriptions of eight studies that met inclusion criteria, synthesis of findings, and implications for future studies. Second, a brief review of the evidence-base for practice-based professional development (PBPD) for SRSD is presented, and a more extensive review of the literature supporting online professional development to support teachers' implementation of evidence-based practices (EBPs) is provided. Information related to PBPD is included to provide background and context for typical professional development (PD) for SRSD. While research has documented characteristics of PD and levels of support that teachers require to implement SRSD effectively and the impact of SRSD instruction on students writing achievement (e.g. Harris, Graham, & Adkins, 2015; McKeown et al., 2016; McKeown et al., 2017) limited research has examined the impact of PD in SRSD on teacher knowledge. Finally, literature regarding online teacher professional is presented. First, an introduction to online professional development

(OPD) is provided through a discussion of recent literature syntheses. Then a systematic review of current literature that involves online teacher professional development is provided. The review of OPD includes a description of 30 studies that met inclusion criteria, synthesis of findings, and implications for future studies.

SRSD as an Evidence-Based Practice

Based upon significant positive effects of SRSD instruction on writing outcomes, SRSD is identified as an EBP for writing instruction for typically achieving students, struggling writers (e.g., at-risk for learning disabilities), and students with LD (Baker et al., 2009; Graham et al., 2012b; What Works Clearinghouse (WWC), 2017). Three reports contribute to the designation of EBP for SRSD. First, the WWC considered 15 single-case studies that met pilot single-case research design standards with reservation. The WWC summarized the evidence supporting SRSD for students with SLD and documented a positive effect of SRSD on writing performance of students in grades 2-12 with SLD, with no negative effects found (WWC, 2017). Second, Baker et al. (2009) reviewed 5 experimental and quasi-experimental studies and 16 single-case design studies to determine the methodological quality of the research and to determine whether the studies met criteria for EBPs. All group studies addressed quality indicators outlined in Gersten et al. (2005), and 9 single-case studies meet quality indicators described in Horner et al. (2005). Both the sets of studies met standards to be considered an EBP for students with and at risk for LD (Baker et al., 2009). Lastly, the IES practice guide entitled *U.S. Institute for Education Sciences Practice Guide: Teaching Elementary School Students to Be Effective Writers* supports that SRSD includes components of

effective writing instruction for elementary level students (Graham et al., 2012b). Specifically, SRSD addresses the following components: (a) provide daily time for students to write; (b) teach students to write for a variety of purposes; (c) teach students to become fluent with handwriting, spelling, sentence construction, typing, and word processing; and (d) create an engaged community of writers.

Meta-analyses of SRSD

Additional documentation of SRSD as an EBP is found in meta-analyses which document larger effects on students' writing performance than other types of writing instruction for students with SLD (Gillespie & Graham, 2014; Graham et al., 2013; Graham & Perin, 2007a, 2007b). A summary of the two most recent meta-analyses (Gillespie & Graham, 2014; Graham et al., 2013) follows.

Both Gillespie and Graham (2014) and Graham et al. (2013) examined studies that involved students in grades 1-12. Gillespie and Graham (2014) included only group studies of writing interventions for students with SLD, while Graham et al. (2013) reviewed both single case and group studies of SRSD instruction for students who were typical writers, struggling writers, or students with disabilities. The purposes of the reviews were to determine whether writing interventions are generally effective for students with SLD and which specific interventions are effective (Gillespie & Graham, 2014) and to determine (a) if SRSD instruction improved students' writing performance, (b) if SRSD instruction is more effective for younger students versus older students, (c) if SRSD is more effective in any one genre, (d) if teachers can apply SRSD effectively, (e) if independent evaluation support the effectiveness of SRSD, and (f) if the explicit

teaching of self-regulation enhance writing performance (Graham et al., 2013).

Gillespie and Graham (2014) examined whether specific writing interventions that focused on strategy instruction, dictation, goal setting, and process writing had significant effects on students' writing quality. Of the four categories of effective interventions, strategy instruction was found to have the largest effect ($ES = 1.09$, $p < .001$). Studies that used SRSD were included in the category of strategy instruction, and Gillespie and Graham (2014) conducted further analyses to compare the effectiveness of non-SRSD strategy interventions ($ES = 0.76$) studies to SRSD studies ($ES = 1.33$). Effect sizes for studies that included SRSD were statistically significantly larger ($Q = 12.06$, $df = 1$, $p < .01$).

Graham et al., (2013) addressed the following questions related to SRSD: (a) does SRSD instruction improve students' writing performance, (b) is SRSD instruction is more effective for younger students versus older students, (c) is SRSD is more effective in any one genre, (d) can teachers implement SRSD effectively, (e) does independent evaluation support the effectiveness of SRSD, and (f) does explicit teaching of self-regulation enhance writing performance. A summary of questions a through d is provided.

Writing Performance

First, to determine the effectiveness of SRSD on students' performance, Graham et al. (2013) examined results for students in general, followed by an examination of results for students with SLD, students with emotional and behavioral disorders, students who are weaker writers, and typically developing students. The impact of SRSD was examined based on writing measures of quality, elements, and length. A summary of

results for both students in general and students with SLD is provided. SRSD was effective for students in general with the following effect sizes: quality (*ES* = 1.75), elements (*ES* = 2.24) (ES > 0.80 considered large). Students maintained effects between two and 28 weeks: quality (*ES* = 1.30), elements (*ES* = 1.41). SRSD was moderately effective on measures of length (*ES* = 0.47) at posttest and minimally effective at maintenance (*ES* = 0.001). SRSD was effective for students with SLD with the following effect sizes: quality (*ES* = 2.37). Researchers were unable to calculate average effect sizes for other measures due to lack of at least four effects available for analysis.

Effectiveness Based on Age

Graham et al., (2013) determined the effect of SRSD on students in elementary grades compared to those in secondary grades (e.g., middle school and high school). At the elementary level, SRSD instruction resulted in large effects for writing quality (*ES* = 1.40) and elements (*ES* = 2.41). At the secondary level, SRSD instruction resulted in large effects for quality (*ES* = 2.18) and elements (*ES* = 1.86). No statistically significant differences between quality (p = .16) and elements (p = .37) for the two different education levels.

Effectiveness Based on Genre

Story and persuasive writing were the focus studies included in the meta-analysis. SRSD instruction resulted in large effects for story quality (*ES* = 1.17), story elements (*ES* = 2.57), persuasive quality (*ES* = 1.97), and persuasive elements (*ES* = 1.55). Statistically significant differences were not found between quality (p = .11) and elements (p = .07) for the two genres.

Teacher Application

Outcomes of studies that used teachers as the instructor were compared with outcomes of studies that used researchers as instructors to determine whether the effect sizes were significantly different. SRSD had large effects for quality (*ES* = 1.52) and elements (*ES* = 2.55) when teachers were instructors. Large effects for quality (*ES* = 2.17) and elements (*ES* = 1.86) when researchers were instructors were also documented. No statistically significant differences in quality ($p = .30$) were found; however, statistically significant larger effects for elements ($p < .001$) in favor of teachers as instructors were found.

Systematic Review: SRSD for Opinion Writing of Students in Grades K-6

Opinion and persuasive writing requires the use of written language to analyze and discuss controversial views. Students typically develop skills to successfully complete opinion writing successfully as they progress through grade levels and into young adulthood (Nippold et al., 2005). Students are expected to complete opinion writing in the elementary grades, and opinion writing is foundational to argumentative writing that students are expected to complete at the middle and high school level (CCSS, 2018). Both Gillespie and Graham (2014) and Graham et al. (2013) found that relatively few studies focused on opinion or persuasive writing. In Gillespie and Graham (2014), only 14% of SRSD studies focused on persuasive writing, while in Graham et al. (2013) only 20% of studies focused on persuasive or opinion writing.

A systematic review was conducted to determine the current research base for opinion (persuasive) writing for students in the upper elementary grades. First, search

criteria and methods are described. Second, results are presented, followed by a discussion of results.

Results indicated that students in experimental classes wrote longer essays that contained more elements of opinion essays compared to comparison classes. Students with SLD in experimental classes wrote longer essays that contained more elements of opinion essays compared to students with SLD in comparison classrooms. Students provided generally positive responses regarding questions of acceptability.

Method

Databases (a) Education Resources Information Center (ERIC), (b) PsychInfo, (c) Education Research Complete for years 1997-2018. The following Boolean phrase was entered, ("self-regulated strategy development" or "self regulated strategy development" or SRSD) and (opinion or persuasive or persuade)

Inclusion Criteria

Articles were considered for inclusion if they were published in a peer-reviewed journal with participants who were typically developing, struggling writers (at risk), or students with SLD students in grades 4 or 5 in U.S. public elementary schools. Included studies also had an independent variable of opinion or persuasive writing instruction through SRSD and dependent measures of student writing performance.

An electronic search yielded 57 articles after exact duplicates were removed. All 57 titles and abstracts were read, and eight met inclusion criteria. The most frequent reasons for exclusion was that studies did not contain the target population (n = 35), such as studies that contained students who were in grades higher than fifth grade or studies

that included participants with disabilities other than SLD (i.e., autism, emotional behavioral disability). Some studies included students with SLD, but the performance of students with SLD could not be determined because results were not disaggregated. Other exclusions include publications were not studies (n = 11), studies were not based on opinion writing (n = 2), and a study was a duplicate (n = 1).

An ancestral search of recently published literature reviews of writing instruction (e.g., Graham et al., 2013; Graham, Harris, & Santangelo, 2015; Gillespie & Graham, 2014; Graham et al., 2017; Kaldenberg, Ganzeveld, Hosp, & Rodgers, 2016) was conducted. This search yielded three additional studies for a total of 11 studies.

Each of the 11 texts was read in entirety to determine inclusion in the review. Three studies were eliminated. One article was a summarization of previously published studies, one study included middle school participants, and one study included only participants with EBD. Eight studies remained.

Coding Procedures

Articles were coded for (a) participant characteristics, (b) study setting, (c) characteristics of treatment implementer, (d) implementer training provided, (e) treatment fidelity, (f) dependent measures, and (h) study results. A coding sheet was used to record information and data were entered into Microsoft Excel.

Results

Research Design

A total of eight studies were identified for inclusion in the literature review (De La Paz & Graham, 1997; Graham et al., 2005; Harris et al., 2012a; Harris et al., 2012b;

Harris, Graham, & Mason, 2006; Little et al., 2010; Mason et al., 2017; Troia, Graham, & Harris, 1999). Table 1 provides a summary of results. Three of the studies were multiple-probe across participant, single-case research designs (De La Paz & Graham, 1997; Little et al., 2010; Troia et al., 1999), while five studies utilized randomized control trial group research designs (Graham et al., 2005; Harris et al., 2012a, 2012b; Harris et al., 2006; Mason et al., 2017). The studies included grade levels 2- 6, with some studies including mixtures of students in grades 2 and 3 (Harris et al., 2012a, 2012b) or grades 5 and 6 (Mason et al., 2017). The majority of studies were conducted in grades 2 or 3 (n =5) (Graham et al., 2005; Harris et al., 2012a, 2012b; Harris et al., 2006; Little et al., 2010), while fewer studies were conducted in grade 5 (n = 3) (De La Paz & Graham, 1997; Mason et al., 2017; Troia et al., 1999). No studies were conducted in grade 4. Studies included students at-risk for writing difficulties (n = 4) (Graham et al., 2005; Harris et al., 2006; Little et al., 2010; Mason et al., 2017), students with SLD (n = 2) (De La Paz & Graham, 1997; Troia et al., 1999), and the full range of students in the general education setting (n = 2) (Harris et al., 2012a, 2012b).

Participant Characteristics

Participants included 1064 students with nearly equal numbers of female (n = 539, 51%), male (n = 525, 49%). The majority of participants were in grades 5 and 6 (n = 598, 56%), with fewer participants being in grades 2 or 3 (n = 466, 44%). Seven studies provided information on race or ethnicity, which included a total of 472 students who were Caucasian (n = 342, 72%), African American (n = 109, 23%), Hispanic (n = 19, 4%), and Asian (n = 2, 1%).

Settings and SRSD Implementation

Most studies (*n* = 6) utilized the TREE writing strategy for persuasive or opinion writing, while other strategies included SPACE and DARE (*n* = 1), and STOP and DARE (*n* = 1). The majority of studies used graduate students as the SRSD instructor (n = 5). Three studies used the teacher as the instructor, which included two studies that also investigated the use of PBPD for SRSD.

Training to Implement SRSD and Treatment Fidelity

Six studies included a description of training provided to the SRSD instructor (Graham et al., 2005; Harris et al., 2012a, 2012b; Harris et al., 2006; Little et al., 2010; Mason et al., 2017). The two studies that did not include a description of instructor training utilized the researcher as the treatment implementer (De La Paz & Graham, 1997; Troia et al., 1999). Three studies described training as material and training provided with practice implementing lessons until trainee could do so without error (Graham et al., 2005; Harris et al., 2006; Little et al., 2010). Self-regulated strategy development instructors in the three studies implemented SRSD instruction with 94% or higher fidelity as measured by researcher observation. Three studies described instructor training as PBPD for SRSD (Harris et al., 2012a, 2012b; Mason et al., 2017). PBPD ranged from one-day in-person training with virtual consultation (Mason et al., 2017), to two-day in-person training (Harris et al., 2012a, 2012b). Treatments implementers in the three studies implemented SRSD instruction with 85% or higher fidelity as measured by researcher observation.

Dependent Measures

All studies used students' writing samples as dependent measures; however, different aspects of writing samples were examined across studies. Two studies examined evidence of student planning for opinion writing (De La Paz & Graham, 1997; Troia et al., 1999). Four studies measured student academic engaged time or writing time (De La Paz & Graham, 1997; Harris et al., 2012a; Mason et al., 2017; Troia et al., 1999). Seven studies included measures of length and quality (De La Paz & Graham, 1997; Graham et al., 2005; Harris et al., 2012a, 2012b; Harris et al., 2006; Little et al., 2010; Troia et al., 1999). All studies included the number of genre elements as a writing outcome measure.

Outcomes

Overall, SRSD instruction was effective in improving writing performance of participants (See Table 1 for results). For this review, results from studies with the common measures of quality, genre elements, and length are briefly described. Six of the seven studies that reported results on the quality of writing found positive effects (De La Paz & Graham, 1997; Graham et al., 2005; Harris et al., 2012a, 2012b; Harris et al., 2006; Little et al., 2010). All studies reported a positive effect on essay elements. Two studies indicated no significant effect on length of essays (Harris et al., 2012a, 2012b); however, it was noted that length is not always equated with quality.

Social Validity

Social validity refers to the acceptability of procedures, goals, and outcomes used in a specific practice in research (Kazdin, 1977; Wolfe, 1978). The probability that an evidence-based practice will be implemented with fidelity is increased if the practice has

high social validity; that is teachers are more likely to implement a practice that has acceptable procedures, goals, and outcomes (Domitrovich et al., 2008). Both high implementation and social validity are described as crucial to widespread acceptance and implementation of SRSD (Harris et al., 2015). Five of the seven studies measured social validity. Three studies measured only student social validity using student interview (De La Paz & Graham, 1997; Harris et al., 2006; Troia et al., 1999). Students generally reported that SRSD was acceptable and that they used the strategies for writing. Two studies measured both teacher and student social validity using and the Intervention Rating Profile and the Children's Intervention Rating Profile (Harris et al., 2012a; Little et al., 2010). The rating profiles were given at prior to the intervention and just after the intervention. Results were positive and indicated that the intervention exceeded the expectations of teacher and students before the intervention implementation. Teachers generally reported that the procedures were acceptable and that they would be likely to use SRSD in the future.

Discussion

Although the literature base that supports the efficacy of SRSD for teaching writing is large, the literature base for implementing SRSD for opinion writing with upper elementary students who are in the general education setting, at-risk for writing difficulties, or SLD, is not as substantial. Only eight studies met inclusion criteria. Furthermore, the search spanned grades 2- 6; however, no studies included students in fourth grade. Because many studies document the efficacy SRSD to teach elementary students to write, it is surprising that no fourth-grade students were included. Also,

Table 1

Studies of SRSD Instruction in Opinion Writing for Students in Grades 2-5

Study and Design	Participants	Instructional Setting	SRSD Instructor	Instructor Training	Treatment Fidelity	Dependent Measures	Results
De La Paz & Graham, 1997 SC	N: 3 Grade: 5 Dis: GE M: 33% F: 67%	Separate	RT	Description not given	instructor checklist, 25% tape recorded;	1. time spent planning, 2. unique ideas in plans, 3. transformation of plan, 4. writing time, 5. strategy use, 6. length of essay, 7. essay elements, 8. coherence, 9. quality	1. not effective 2. effective for 2/3, 3. effective, 4. effective, 5. effective, 6. effective, 7, effective, 8. effective, 9. effective
Graham, et al., 2005 RCT	N: 72 Grade: 3 Dis: Mixed (20 were SWD) M: 61% F: 39%	Separate	RT	material and training provided, practice implementing lessons until they could do so without error	training to criterion, instructor checklist, 30% of lessons tape recorded, lessons rated for quality	writing samples for story, persuasive, personal narrative, and informative writing (measured for each: composing time, NWW, quality, genre elements), writing knowledge survey, self-efficacy	1. SRSD students spent more time composing stories, 2. no transfer of skills to narrative writing, but transfer to informative (for SRSD +peer support) 3.SRSD more basic elements, 4. qualitatively better stories 5. better scores for knowledge, 6. no differences for self-efficacy, 7. SRSD Longer essays and stories
Harris et al., 2012a RCT	N: 262 Grade:2-3 Dis: Mixed M:50% F:50%	GE classroom	T	PBPD	observation of 25% of instructional sessions	quality, length, genre elements	elements (*ES* = 2.02), quality (*ES* = -9.14), Length (*ES* = 0.13-0.27)
Harris et al., 2012b RCT	N:56 Grade: 2 Dis: GE M:68% F: 32	GE classroom	T	PBPD	observation of 25% of instructional sessions, teacher checklists	elements, quality, NWW, academic engaged time	Quality (*ES* = 0.51- 1.15) Elements (*ES* = 0.54- 0.78) NWW- no reliable increases Academic engaged time- no influence on engaged time

Table 1 (Continued)

Studies of SRSD Instruction in Opinion Writing for Students in Grades 2-5

Study and Design	Participants	Instructional Setting	SRSD Instructor	Instructor Training	Treatment Fidelity	Dependent Measures	Results
Harris et al., 2006 RCT	N: 63 Grade: 2 Dis: GE, AR M: 59% F: 41%	Separate	RT	material and training provided, practiced lessons to mastery	training to criterion, instructor checklist, 30% of lessons tape recorded, lessons rated for quality	writing samples for story, persuasive, personal narrative, and informative writing (measured for each: composing time, NWW, quality, genre elements), writing knowledge survey, self-efficacy, motivation	positive effect on writing performance, SRSD-only spent more time planning, SRSD-only wrote longer, more complete, and qualitatively better persuasive papers than comparison, increase in knowledge
Little et al., 2010 SC	N:13 Grade:2 Dis: AR M: 54% F: 46%	NG	RT	10 hours, trained until they could fluently model all lessons without errors	trained to criterion, weekly meetings with researchers, checklist, 27-44% of sessions for each student observed for treatment integrity	1. number of essay elements, 2. number of words, 3. overall quality, 4. evidence of planning	persuasive elements: PND 100%, gains in # of words written and quality
Mason et al., 2017 RCT	N: 592 Grade: 5-6 Dis: AR, SLD M: 45% F: 55%	GE Classroom	T	PBPD 1 day, Virtual consultation	Teacher checklist	elements	intervention group higher on total elements
Troia et al., 1999 SC	N:3 Grade:5 Dis: SLD M:67% F: 33%	NG	RT	Description not given	lesson checklist, audiotape of each session, 1/3 listened to by a rater	1. plans 2. strategy use 3. writing time 4. length 5. story grammar 6. essay elements 7. story quality,8. essay quality,	increase in planning, planning time, writing time, length, essay elements, but not quality

Note: AA = African American, AR = at risk, Dis = disabiility, F = female, GE = general education, M = male, N = number, PBPD = practice-based professional devleopment, RCT = randomized control trial, RT = research team, SC = single case, SLD = specific, SWD = students with disabilities, SLD = learning disability, T = teacher

because many standardized assessments, such as NAEP, typically take place in fourth grade, it seems that a greater focus on instructing fourth-grade students in writing would be evident in the literature. Only two studies specifically focused on the performance of students with SLD, and both studies were multiple baseline, single-case research design (De La Paz & Graham, 1997; Troia et al., 1999). Although only two studies focused exclusively on the performance of students with SLD, other studies that included the full class also included students with SLD. Due to changes in identification of students with SLD, the implementation of response to intervention in schools, and the large proportion of students with SLD who receive instruction in the general education setting, it is likely that students with SLD are more easily accessed for instruction in the general education classroom. Interestingly, only three studies used the teacher as the treatment implementer, two of which examined the effectiveness of PBPD for SRSD. PBPD to teach teachers to use SRSD will be described in subsequent sections. Self-regulated strategy development was generally well received by both teachers and students. Given that SRSD is an EBP that is not widely implemented (Harris & Graham, 2016), positive findings from social validity measures are promising that teachers and students will be likely to use SRSD when introduced to is.

Practice-based Professional Development

The use of PBPD has recently been investigated for training teachers to use SRSD to teach writing. A recent review of PBPD for SRSD (Rouse & Kiuhara, 2017) included five studies conducted between 2012 and 2016 that examined the effectiveness of PBPD to train teachers to implement SRSD. The quantitative studies included PBPD that was

conducted over two days. Teachers taught either story or opinion writing to students in grades 2, 3, 4, or 8. Dependent measures were consistent with SRSD literature and included measures of genre elements and writing quality. All studies resulted in positive impacts on student writing outcomes with large effect sizes (*ES* = 0.77 – 3.29). Training facilitators provided consultation to teachers throughout the implementation of SRSD to support implementation, and in some cases, differentiation. Teacher outcomes were measured by teacher implementation of SRSD through observation using a checklist of critical instructional components. All teachers were able to implement SRSD with a moderate to high level of fidelity (78% - 99%). Social validity was assessed in all studies through the Teacher's Intervention Rating Profile (Festas et al., 2015), Student's Intervention Rating Profile (Festas et al., 2015); Intervention Rating Profile (Harris et al., 2012a), Children's Intervention Rating Profile (Harris et al., 2012a), teacher interview (Harris et al., 2015; McKeown et al., 2016), and student interviews (McKeown et al., 2016). Across the studies, teachers and students responded favorably to SRSD instruction. Teachers reported that they thought SRSD instruction positively impacted their students' writing and that they would continue to use SRSD. No quantitative studies examined teachers' acceptability of PBPD for SRSD, nor the impact of SRSD on teachers' content knowledge.

One study that included a qualitative analysis and teacher interviews (McKeown et al., 2017) examined teacher feedback regarding acceptable and less acceptable aspects of PBPD and SRSD, as well as what aspects that teachers found to be important. Fourteen second and third grade teachers who had participated in a randomized control

trial study of PBPD for SRSD were included in the in-person interviews, while six additional teachers submitted their responses to interview questions via email. Researchers used a constant comparative method to determine patterns in the interview data. Four broad categories of teacher perspectives were identified: PBPD, teaching SRSD, SRSD's impact on students, and teacher suggestions for improvement. Selected topics are summarized here to provide context for the research design of the proposed study. In relation to PBPD, teachers felt that cognitive modeling and the use of self-statements were difficult and thought the time provided to practice during PBPD was valuable. Teachers also thought that a group of 6-10 teachers is appropriate for training because it is a small, safe number to be able to practice, share, and receive feedback. Teachers shared some concerns that being monitored for fidelity may have impeded some authentic differentiation of instruction for fear that a step on the fidelity checklist might have been missed. In relation to teaching SRSD, in general teachers felt that the modeling was important and that the students benefited from teachers' modeling of self-talk; however, some teachers found it difficult to incorporate self-talk. Related to SRSD's impact on students, teachers found that students of varying writing abilities and behavior challenges improved in the quality of their writing, as well as their confidence. Teachers provided several suggestions for improvement including the need for incorporating more mechanics of writing, meeting the needs of more capable learners, and utilizing small groups and pairs. Because SRSD is flexible, teachers are able to incorporate teaching and strategies to address these concerns.

Two additional studies conducted after publication of Rouse and Kiuhara (2017) (Mason et al., 2017; McKeown et al., 2018) provide important information regarding PBPD and SRSD. Mason et al. (2017) conducted a randomized controlled trial to determine the effects of PBPD in a 1-day training, followed by virtual consultation, with fifth and sixth-grade teachers in the general education setting. Teachers used SRSD instruction to teach persuasive writing. Students in the intervention group improved in total words written and genre elements. In a subsequent study, McKeown et al. (2018) investigated the effects of PBPD on teachers' abilities to implement SRSD and third, fourth, and fifth grade students' persuasive writing. Third, fourth, and fifth grade teachers in the experimental group received PBPD for SRSD across two days. Teachers then taught SRSD lessons to their students. Teacher measures were observations for fidelity and social validity interviews. Researchers observed 33% of each teacher's lessons and provided feedback regarding fidelity via email using a standardized email template. Additionally, teachers were provided with opportunities to ask questions to researchers before and after observations. Results of fidelity observations indicated that teachers implemented SRSD with moderate fidelity (mean of 74.32% of writing activities completed). However, teaching to mastery and using formative assessment to inform instructional decisions were not observed in teachers' lessons, although it was instructed and practiced during PBPD. Based upon social validity interviews teachers found the intervention to be useful, but found it difficult to set aside time for the intervention. Student dependent measures were pretest and posttest persuasive writing samples that were scored for holistic quality, persuasive elements, and length. Both holistic quality

and persuasive elements increased for students in the experimental group. However, lengths of compositions decreased. Of the variables examined, race and grade level negatively impacted holistic quality of students' writing. Of the variables examined, grade level and teacher experience in their current grade level positively impacted persuasive element of students' writing. Of the variables examined, race and status as a struggling student, and grade level impacted the length of students' writing such that Hispanic students and struggling students wrote longer essays than other students, and students increased the length of essays with an increase in grade level. Total years teaching and teacher experience in their current grade level significantly impacted the length of students' writing, with essays being shorter with more years of teaching experience and experience at the current grade level.

One additional study that examined the impact of PBPD (Harris et al., 2016) included special education teachers in grades 5 and 6. Teachers taught students with disabilities to write persuasive essays citing text-based evidence. Specific disabilities are not specified in the presentation. Teacher measures included: (a) self-report of teaching efficacy for writing, and for teaching persuasive writing from source text, and (b) teacher report of students' abilities to write persuasively from source text. Teachers reported improved self-efficacy for teaching persuasive writing from source text, and that students' abilities to write persuasively from source text were improved. Student measures included writing samples scored for holistic quality, plan quality, transition words, number of words, total functional elements, and total nonfunctional elements. Additionally, measures of genre/task knowledge, writing process knowledge, reading

recall and student self-efficacy for writing were completed. Results for all measures significantly increased from pretest to posttest except reading recall and student self-efficacy. While implementation fidelity levels were not reported, researchers indicated that one out of the nine teachers struggled with implementation.

Advantages and Challenges of PBPD

PBPD offers many benefits to teachers including potentially increased self-efficacy, opportunities to practice instruction with peers, and support from an expert. First, many teachers report low self-efficacy for teaching writing, which in turn affects feelings about teaching writing and instructional effectiveness (Harris & Graham, 2016). One study (Harris et al., 2016) indicated that teachers reported increased self-efficacy for teaching writing after completing PBPD for SRSD. Another advantage of PBPD for SRSD is that teachers are provided with opportunities to practice SRSD instruction with peers using materials that will be used to teach students (Harris et al., 2012b). When teachers practice teaching the strategy in the PBPD setting, instructors have the opportunity to coach and problem-solve before teachers implement the instruction with students (Ball & Forzani, 2009). PBPD embeds support for teachers to implement a new practice which can impact the sustainability of the new technique (Desimone, 2011). Professional development, such as PBPD, that allows teachers to experience implementation of a practice using materials that will be used with students may be especially helpful for teachers of struggling writers. SRSD is a framework for instruction that allows for teacher differentiation to meet students' needs; however, research supports that teachers may require sustained practice and support to differentiate effectively

(McKeown et al., 2016). Such practice opportunities are available though PBPD.

While many advantages of PBPD are evident, limitations of PBPD include expense, time, and physical location. Resources required to implement PBPD include hiring of trainers or consultants to provide the training, which may be expensive. Current studies of PBPD have implemented the training over 1-2 days. If training takes place during the school year, teachers may require a substitute teacher for days that they are in training, which would also be an expense. The PBPD framework involves collaboration of teachers in the same school, which may be problematic if districts want a specialized teacher (e.g. a special education teacher) to participate in the training. The specialized teacher may not have teachers with similar responsibilities available for collaboration. Schools in rural settings also face challenges of being in locations that are difficult for trainers to access for consultation or locations that may inhibit collaboration among schools in a district. Mason et al. (2017) sought to address some of the challenges of PBPD in a rural setting by decreasing training time to one day, rather than two and added the use of virtual rather than in-person consultation. Although evidence for the effectiveness of PBPD for SRSD is available, educational professionals must consider both the benefits and limitations when deciding if PBPD is appropriate for their setting, and the potential for other types of PD that addresses the limitations in the implementation of PBPD

Online Professional Development

Online professional development (OPD) addresses some of the limitations of in-person PD, such as circumventing issues of time and distance (Dede et al., 2009). OPD

may be delivered in a format allows individuals to participate at different times (asynchronously) through e-mail and discussion boards. Another format of OPD allows individuals to participate at the same time (synchronously) through chats and audio or video tools. Additionally, some OPD uses a combination synchronous, asynchronous, and in-person formats (U.S. Department of Education, 2010).

Many studies of OPD have relied on teacher self-report of change related to OPD to determine its effectiveness. However, few studies have investigated the effects of OPD on teacher quality and student achievement (Ginsberg, Gray, & Levin, 2004; Lawless & Pellegrino, 2007; Dede et al., 2009). For example, in their systematic review of the literature on OPD, Dede et al. (2009) identified 40 studies that focused on program design, program effectiveness, program technical design, and learner interactions, with no focus on student achievement. The purpose of the review was to highlight key teacher OPD areas in need of research. Based on their review Dede et al. (2009) provided several recommended areas for further research for OPD including research that addresses interventions to (a) increase teacher content knowledge, (b) transform teacher practice, (c) impact student learning, (d) determine factors to sustain teacher improvement, and (e) improve scalability of OPD to a variety of research contexts. Additionally, authors suggested that OPD developers and researchers utilize online environments that already exist rather than using funds to create variations. Dede et al. (2009) suggested that an expansion and variety of research models be used to incorporate both formative and summative methodologies, as well as empirical and mixed-methodologies. Furthermore, research should not replicate methods used for study of face-to-face PD, but rather seek

to collect data that is unique to OPD (e.g. questions of online collaboration, communication, and community).

In a recent review of OPD literature, Elliott (2017) identified 107 documents. The purpose of the review was to describe the evolution of teacher professional development from the historical aspects of professional development to online professional development. The review and discussion of literature was organized by the topics of (a) relevant learning theories; (b) political and professional factors that influence professional development; and (c) and the criteria necessary for effective OPD. Elliott suggested that OPD should follow the same criteria for effectiveness that have been identified for face-to-face instruction, while building the OPD from "the ground up" rather than taking a face-to-face program and transferring it to an online format. Although Elliott documents relevant topics related to OPD, no indication of whether research addressed the impact of OPD on student achievement, nor the types of research designs included in research was provided. Furthermore, academic subjects that are addressed in the OPD literature were not specified.

Systematic Review of Online Professional Development

While PBPD and OPD have been used for training teachers to implement SRSD, no peer-reviewed research has been documented the effects of OPD for SRSD on student or teacher outcomes. OPD for SRSD is available from two developers, SRSDOnline and thinkSRSD. Both programs were developed in collaboration with leading SRSD researchers and are delivered entirely online. Because no literature is available to support the two OPD programs for SRSD and the lack of recent reviews documenting the focus

and outcomes of OPD, a systematic review of general OPD is provided to determine the literature base for OPD. A systematic review was conducted to determine (a) research designs utilized, (b) academic subjects addressed in OPD, (c) types of teachers involved in training (general education or special education), (d) types of OPD provided, and (e) outcomes of quantitative studies. First, search criteria and methods are described. Second, results are presented. Finally, a discussion of results is provided.

Method

Databases (a) Education Resources Information Center (ERIC), (b) PsychInfo, (c) Education Research Complete for years 2015-2018. The following Boolean phrase was entered, ((online or "web-based") and (teacher) and (professional development)). All references were loaded into DistillerSR software for screening and coding. DistillerSR aids in the management of systematic reviews by tracking the screening, data extraction, and reporting of systematic reviews (DistillerSR, 2018).

Inclusion Criteria

Articles were considered for inclusion if they were published in a peer-reviewed journal and included an experimental or descriptive study conducted in the United States that involved online or computer-based teacher professional development. Studies were excluded if the training involved preservice teachers, did not address training or PD, was not a study (i.e, descriptive articles), or was in a location outside of the United States.

The electronic search yielded 778 articles after exact duplicates were removed. All titles and abstracts were read, and 690 articles were excluded. The remaining 88 articles were read in their entirety resulting in an additional 58 articles being excluded.

Reasons for exclusion were articles did not include quantitative or qualitative study designs (i.e., descriptive or informational articles) (n = 70), studies that were not conducted with the target population (i.e. preservice teachers, professions outside of teaching) (n = 56), countries outside of the United States (n = 206), professional development not the focus of the study (n = 158), not online or web-based (n= 258). A total of 30 articles remained.

Coding Procedures

Articles were coded in DistillerSR forms for (a) research designs, (b) academic subjects addressed in OPD, (c) types of teachers involved in training (general education or special education), (d) types of OPD provided, and (e) outcome measurement of quantitative studies.

Results

Research Design and Outcome Measurement of Quantitative Design

A total of 30 studies were identified for inclusion in the review. A summary of results is provided in Table 2. Research designs included quantitative designs (n = 20), qualitative designs (n = 9), and mixed methods design (n = 1). Of the quantitative designs, 10 were descriptive studies, such as correlational research. The remaining 10 studies were group designs such as quasi-experimental or randomized controlled trials. Studies measured outcomes through a variety of tools. Outcome measures are classified as (a) teacher report (n = 25) which includes teacher reports of social validity, self-efficacy, efficacy of training, and changes to classroom practice; (b) classroom observation (n = 8), which includes both direct observation and video observation; (c)

content knowledge of teacher (n = 11), which includes teacher assessments of content knowledge; and (d) performance of students (n = 6), which includes student assessment of learning in a subject area or student content knowledge. Some studies included more than one outcome measure.

Academic Subjects

The majority of OPD studies focused on the academic subject area of science (n = 10). Other subject areas were mathematics (n = 6), English as a second language (n = 2), classroom management (n = 2), English language arts (n = 2), reading (n = 1), collaboration with families (n = 1), social studies (n = 1) writing (n = 1), variety (n = 1), data-based decision-making (n = 2), math and reading (n = 1).

Characteristics of Teachers and Training

Most studies included general education teachers (n = 25), while some include both general education and special education teachers (n = 3). Two studies included only special education teachers. Fifteen studies delivered OPD in an entirely online model, while 11 studies provided OPD through a hybrid model that consisted of some OPD and some in-person professional development. One study utilized a multi-component version of OPD, which included a combination of OPD, in-person PD, and virtual consultation. Three studies used a PD model followed by virtual consultation to support the implementation of the skill that was taught

Discussion

The literature base for OPD contains a variety of research designs and spans many different OPD formats and academic subject areas. Although research has stressed the

value of more rigorous designs that include data regarding the effect of PD on students achievement (Darling-Hammond et al., 2017; Yoon K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. L., 2007)**,** the majority of quantitative studies relied on teachers to report of the effectiveness of the OPD and the implementation of instructional strategies in the classroom. Relying on teacher report only is problematic because without measuring the effect of PD on students' achievement the impact of PD on student growth cannot be assessed. The majority of OPD studies included science and mathematics PD, which is not surprising due to national initiatives that focus on STEAM and STEM learning. Other skills, such as reading and writing are foundational skills to support learning in STEAM and STEM. Because reading and writing are foundational to other academic subjects, further investigation into the use of OPD to enhance instruction in reading and writing is warranted. The majority of OPD studies were conducted with general education teachers. Because general education teachers typically teach science and science instruction was the most frequent focus of OPD, it is logical that more general education teachers were most often included in OPD. Future research should address the impact of OPD with special education teachers as well. Finally, a balance of hybrid OPD and completely online models of OPD were included in the literature. Hybrid models may help to lesson some of the limitations of OPD, such as feelings of isolation or confusion, by providing participants with a chance to interact in a face-to-face setting as well as in an online environment.

Advantages and Challenges of OPD

Advantages to OPD compared to in-person PD are flexibility of time and setting in which teachers participate in PD (Dede et al., 2009). For example, teachers who participate in OPD can complete OPD activities when their time permits. It may not be necessary for teachers to be assigned a substitute while the teachers attends PD, as with some in-person PD. Teachers who teach in rural areas may especially benefit from OPD by allowing opportunities for collaboration across districts (Gaumer et al., 2012; Russell, Carey, Kleiman, & Venable, 2009). In addition, teachers who teach in specialized fields such as gifted or special education may be afforded the opportunity to collaborate with like educators, which may not otherwise be possible (Little & Housand, 2011). While OPD can be provided synchronously or asynchronously, each is flexible to include social interaction (Elliott, 2017). For example, teachers who participate in asynchronous OPD may collaborate with others through email or threaded forums (U.S. Department of Education, 2010), while those who participate synchronously may participate in chatrooms or audiovisual discussion (Elliott, 2017).

Although many benefits of OPD are realized, some limitations exist. First, OPD can be susceptible to design that lacks qualities of effective professional development, and OPD that is not based on quality design risks reduced effectiveness. Additionally, due to the nature of OPD, some learners may feel isolated. Likewise, students may be more susceptible to misunderstanding information if not provided with the opportunity.

Table 2

Studies examining OPD

Study	Design	Academic Focus	Type of Teacher	Type of OPD	Outcome Classification
Baker et al., 2016	qualitative	classroom management	GE	virtual support	TR
Bree et al., 2012	quantitative, descriptive	data-based decisions	SpEd	online	CK
Belland et al., 2015	qualitative	science	GE	hybrid	CO
Choi & Morrison, 2014	quantitative, descriptive	ESL	GE	hybrid	CO, TR
Collier et al., 2017	qualitative	collaboration with families	GE SpEd	hybrid	TR
Dana et al., 2017	qualitative	mathematics	GE SpEd	online	TR
Dash et al., 2014	quantitative, group	mathematics	GE	online	CK, SP, TR
de Kramer et al., 2012	quantitative, group	English language arts	GE	online	SP, TR
Fishman et al., 2013	quantitative, group	science	GE	online	CK, CO, TR, SP
Gaumer Erickson et al., 2012	quantitative, descriptive	data-based decisions	SpEd	online	CK, TR
Goldenberg et al., 2014	quantitative, group	science	GE	online	CK, SP
Hodges & Cady, 2013	quantitative, descriptive	mathematics	GE	hybrid	TR
Hunt-Barron et al., 2015	qualitative	writing	GE	virtual support	TR
Ilaria, 2017	quantitative, group	mathematics	GE	hybrid	CO, TR

Table 2 (Continued)

Studies examining OPD

Study	Design	Academic Focus	Type of Teacher	Type of OPD	Outcome Classification
Kibler & Roman, 2013	qualitative	ESL	GE	online	CO, TR
Malanson et al., 2014	quantitative, descriptive	science	GE	virtual support	SP, TR
Marquez et al., 2016	quantitative, group	classroom management	GE	online	TR
Masters et al., 2010	quantitative, group	English language arts	GE	online	CK, TR
Motoca et al., 2014	quantitative, group	classroom management	GE	MC	CO
Pape et al., 2015	mixed methods	mathematics	GE	online	CK, TR
Polly et al., 2016	qualitative	mathematics	SpEd GE	hybrid	TR
Rasmussen & Byrd, 2016	quantitative, descriptive	science	GE	hybrid	TR
Riel et al., 2016	qualitative	social studies	GE	hybrid	TR
Seraphin et al., 2013	quantitative, descriptive	science	GE	hybrid	CK
Shaha et al., 2016	quantitative, group	reading and mathematics	GE	online	SP
Shea et al., 2016	qualitative	science	GE	hybrid	TR
Stevenson et al., 2015	quantitative, group	science	GE	online	CO, CK, TR
Vereb et al., 2015	quantitative, descriptive	reading	GE	online	TR
Wayer et al., 2015	quantitative, descriptive	various	GE	hybrid	TR
Wong et al, 2016	quantitative, descriptive	science	GE	online	CK

Note: CK = Content knowledge, CO = Classroom observation, ESL = English as a second language, GE = general education, MC= multicomponent, SP = Student performance, SpEd = special education, TR = Teacher report

for appropriate discussion and feedback (Guo, Chen, Lei, & Wen, 2014). These limitations have inspired research in techniques to incorporate effective qualities for PD, help online learners to feel connected, and techniques for meaningful discussion and feedback

The Relationship between Professional Development and Student Learning

It is widely accepted that PD must add to teachers' content knowledge and motivate teachers to incorporate the practice into their classroom for PD to result in instructional change and impact student achievement (Darling-Hammond et al., 2017; Desimone, 2009). Furthermore, assessment of changes in teachers' content knowledge and skills is essential to an understanding of the efficacy of PD. While some researchers support that the focus on content may be the most critical aspect of effective PD (Desimone, 2009), other researchers advocate that a variety of factors may have a role in the efficacy of PD. For example, in a literature review of experimental studies of PD conducted between 1975 and 2016, Kennedy (2016) found positive effects on student learning when studies focused on four persistent challenges of teaching: portraying content in a way that students can understand, containing student behavior, enlisting student participation, and using student data to inform instruction. Whether PD is content focused or addresses critical challenges of teaching, PD research must establish a link between PD and student achievement and be of rigorous design (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Yoon et al. (2007) share similar models to explain the process by which PD affects student achievement. The first component is effective PD adds to teacher knowledge. Next, the added teacher knowledge results in improvement in

classroom teaching. Finally, the enhancements to teaching increase student achievement (Yoon et al., 2007). Consideration to the measurement of variables in studies of PD, such as implementation levels, teacher knowledge, and student achievement impact conclusions that can be made about teachers' change in knowledge and instruction (Wayne, Yoon, Zhu, Cronen, & Garet, 2008). For example, if only content knowledge is measured without measurement of student achievement, it is difficult to determine if the change in content knowledge resulted in changes to instruction or student achievement. The results of the reviews of literature for SRSD to teach opinion writing at the upper elementary level, PBPD for SRSD, and OPD for teachers reveal relationships of the features of the included studies and the impact on teacher knowledge, teacher practice, and student achievement. The following section includes a discussion of the results of the SRSD opinion writing literature review, the PBPD summary, and the OPD literature review in relation to the model of the effects of PD on student learning from Yoon et al. (2007) (See Figure 1).

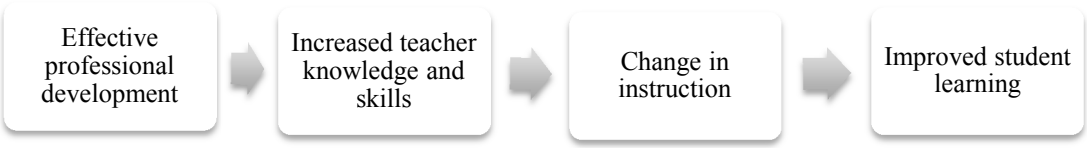

Figure 1: Model of Effects of PD on Student Learning

Effective Professional Development

Because PD in teacher education is critical to ensure that teachers are equipped to implement EBPs (Cook & Odom, 2013), researchers seek to determine elements of PD that promote its effectiveness. Desimone (2009) summarized literature of PD for teachers

and provided a framework of components that are critical to the efficacy of PD: (a) content focus, (b) active learning, (c) coherence, (d) duration of 20 hours or more of contact time, and (e) collective participation. Similarly, in a review of 35 rigorous studies that resulted in support for the link between teacher PD, teaching practices, and student outcomes, Darling-Hammond et al. (2017) identified seven features of effective PD: (a) is content focused; (b) incorporates active learning; (c) supports collaboration; (d) uses models of effective practice; (e) provides coaching and expert support; (f) offers feedback and reflection; (g) is of sustained duration. All studies included in the PBPD summary used PBPD to train teachers to teach SRSD. PBPD incorporates aspects of effective PD by including six critical elements: (a) collaboration among teachers in the same school, (b) creation of PD based on learning needs of students in teachers' classrooms, (c) inclusion of content knowledge and pedagogical knowledge needed for teacher to successfully apply the teaching procedures, (d) application of new procedures through modeling and teacher practice, (e) use of materials during PD that are identical to materials to be used in the classroom, and (f) feedback provided to teachers as they practice and apply new teaching procedures (Harris et al., 2012b). Studies included in the OPD review generally sought to include a model of professional development based on elements of effective PD. For example, based on Desimone (2009) framework of critical components of PD, Pape et al. (2015) provided OPD that focused on mathematics content knowledge, active participation, and collaboration among participants, and a sustained period of PD (e.g., one year). Walker et al., (2012) cited best practices in teacher education for the U.S. Department of Education as the basis of the design of

technology-related teacher professional development to ensure that PD (a) related to the teachers' content area, (b) was collaborative, (c) was consistent with the technology goals in the district, (d) allowed for active engagement with content, (e) was tailored to different levels of teachers' knowledge, skills and interest, (f) was sustained, and (g) included follow-up activities. In another example, Gaumer Erickson et al., (2012) uses a research-based OPD design that is learner-centered, collaborative, and ongoing.

Increased Teacher Knowledge and Skills

Studies included in the OPD review provide support for the impact of PD on teacher knowledge for teaching. Of the OPD studies, 29% measured teacher content knowledge, and 6% of OPD studies measured only teacher content knowledge. For example, Bree, Mims, and Browder (2012) examined the impact of OPD to for instruction in data-based decision making for special education teachers of students with severe disabilities. The pretest-posttest content knowledge measure consisted of definition and application questions. Teachers' content knowledge increased significantly; however because neither student achievement, nor teacher practice were measured, the impact of OPD on student performance or teacher practice cannot be determined. One study (Stevenson, Stevenson, & Cooner, 2015) examined teacher content knowledge and classroom observation. Teacher's content knowledge improved as well as their ability to deliver instruction in the science classroom. Three OPD studies included measures of teacher content and student performance. Fishman et al. (2013) found improvement in teacher content knowledge, teacher practice, and student acheivement. Fishman et al. (2013) sought to determine differences in the impact of OPD

and face-to-face PD. Student acheivement was improved for students of teacher in both the OPD and face-to-face PD groups. Dash et al.(2012) and Goldenberg, Culp, Clements, Pasquale, and Anderson (2014) found that teacher content knowledge improved but there was no significant change in student acheivement. Of the three studies only Fishman et al., (2013) measured teacher practice by observation, thus it is difficult to determine how the OPD in Dash et al. (2012) and Goldenberg et al., (2014) influenced how teachers taught. It is recommended that future studies of OPD include follow-up with teachers to support and sustain change. Additionally, Dash et al. (2012) states the measurement time period as a limitation as students may have been assessed before teachers had an opportunity to implement changes based on the OPD. Thus, it is recommended that researchers give attention to when measurement takes place following PD. Although studies of SRSD and PBPD typically included measures of teacher implementation and student achievement, measurement of teacher content knowledge was absent from the pool of studies included in the reviews. Although teachers and researchers were able to implement SRSD with fidelity, often with provided lesson plans and fidelity checklists, it is difficult to determine how training for SRSD impacted teachers' content knowledge.

Changes in Instruction

Many studies included in the SRSD opinion writing review, the PBPD summary, the OPD review, and OPD studies included measurement of teacher practice. In the review for SRSD to teach opinion writing, all of the studies in which the researcher was not the treatment implementer described training and practice to criterion prior to

teaching lessons. This illustrates the importance of teachers being able to learn and practice with novel teaching models prior to implementing with students. As a result, treatment implementers were able to teach lessons with high levels of fidelity. For example, treatment implementers in Graham et al., (2005), Harris et al. (2006), and Little et al. (2010) achieved 94% fidelity or higher as measured by research observation. In PBPD studies, fidelity is somewhat lower than in studies that include members of the research team as treatment implementers. Harris et al. (2012a), (2012b), and Mason et al. (2017) included PBPD for opinion writing in upper elementary grades and teachers achieved 85% fidelity or higher as measured by researcher observation. Studies on PBPD also suggest that teachers value time provided for practice, especially for modeling and self-talk (McKeown et al., 2017). Likewise, results of the OPD studies that included observation of teacher practice found that OPD often resulted in improvement to teacher practice. For example, Choi and Morrison (2014) examine hybrid OPD to teach effective practices for English language learners. Teachers were observed for evidence of implementing the practices across two school years. Results indicated that teachers consistently improved in their use of the practices over the course of two years. Motoca et al. (2014) observed teacher lessons to examine the impact of a multicomponent OPD on teachers' use of evidence-based practices for classroom management. Results indicated that intervention classroom teachers provided more positive feedback to students. In addition the teachers displayed more effective use of classroom structure, behavior management, communication with students, groups and social dynamics, and motivation strategies. Many of the OPD studies differed from SRSD and PBPD studies in the

method of measuring impact on teacher practice. SRSD and PBPD typically use a checklist of lesson components to measure teacher fidelity to the SRSD framework for instruction whereas OPD measurements of impact on teacher practice are often broader measurements of implementation of a variety of evidence based practices (as described in the previous examples). Although methods of measurement are different, both PBPD and OPD studies generally found that PD positively impacted teachers' implementation of the trained teaching practice.

Improved Student Learning

Lastly, studies in the reviews that measured student acheivment support that student acheivment may be impacted when teachers participate in efffective professional development. All quantitative studies of SRSD opinion writing and PBPD resulted in moderate to large effects on student writing acheivment as measured by evaluation of student writing samples. Interestingly, the majority of the studies also included a measurement of teacher implementation. Six OPD studies examine student performance. Of the six studies, three (de Kramer, Masters, O'Dwyer, Dash, & Russell, 2012; Fishman et al., 2013; Malanson et al., 2014) found a significant increase in student performance following teacher OPD. Studies that did not document a significant increase in student performance did however document positive effects of PD on student performance. Hypotheses for lack of student performance include a lack of alignment between curriculum, OPD, and teacher goals (Dash et al., 2012; Goldenberg et al., 2014) and limited time for teachers to implement the teaching practices after OPD (Dash et al.,

2012); thus researchers of PD must seek to ensure PD is aligned with curriculum and goals, as well as be attentive to implementation and measurement timelines.

Implications

It is encouraging that effects were found for teacher content knowledge, teacher practice, and student acheivment following PBPD or OPD; however, only one study included in the reviews assessed teacher content knowledge, teacher practice, and student acheivment (Fishman et al., 2013). Researchers must give careful consideration to the measurement of variables in studies of PD, such as implementation levels, teacher knowledge, and student achievement, to allow conclusions to be made about teachers' change in knowledge and instruction (Wayne et al., 2008). If only content knowledge is measured without measurement of student achievement, it is difficult to determine if the change in content knowledge resulted in changes to instruction or student achievement. Similarly, if changes to teacher content knowledge and student achievement are measured without assessing the impact on instruction, it may be difficult to determine the effectiveness or ineffectiveness of PD on changing teacher practices.

Summary and Conclusion

Students face challenges in writing that may potentially be addressed through the use of EBPs, such as SRSD. Research supports the use of SRSD to impact students writing performance and is effective for struggling writers, SWD, and students in typically developing students. Research supports SRSD to teach opinion writing at the upper elementary level; however, research has not addressed SRSD to teach opinion writing to fourth grade students who are typically developing, struggling writers, or

students with SLD. PD is one way for teachers to learn to effectively implement EBPs such as SRSD. Many models of PD are utilized, two of which are PBPD and OPD. PBPD has a small, but growing research base to support its use in preparing teachers to implement SRSD. While PBPD has been shown to have many benefits, challenges remain in implementing SRSD (e.g. time constraints and funding). An alternative to PBPD for training teachers to use SRSD is OPD. OPD programs for SRSD are being utilized across the nation to train teachers to implement SRSD in schools; however no research has supported the use of OPD for SRSD. Although the specific OPD programs for SRSD have not been investigated, OPD has been used successfully to prepare teachers to teach other subjects such as science and mathematics. Utilizing effective PD may result in more effective translation of research to practice; however it is important to investigate how PD influences teacher content knowledge, teacher practice, and student achievement to more fully understand the efficacy of PD.

Chapter 3

Method

This chapter provides a description of the methods used to conduct a pretest-posttest cluster randomized control trial (cRCT) study to determine the impact of self-regulated strategy development (SRSD) instruction on students' opinion writing performance. Additionally, description of methods to address secondary analyses to determine changes in teachers' knowledge of SRSD and teachers' perceptions of online professional development (OPD) are included. This chapter is divided into the following sections: (a) research questions, (b) research design (c) variables, (d) population, (e) sample size, (f) participants, (g) setting, (h) instrumentation, (i) procedures, (j) instruction, and (k) analysis.

Research Questions

The following primary research questions were addressed at the student level:

1. What is the effect of SRSD writing instruction provided by upper elementary teachers who have completed SRSD Writing to Learn™ online training compared to writing instruction by upper elementary teachers in a business-as-usual comparison group on students' writing achievement on opinion writing samples as measured by: (a) the number of genre elements included in students' opinion writing samples and (b) the length of students' opinion writing samples?
2. What are the differential effects of SRSD instruction provided by upper elementary teachers who have completed SRSD Writing to Learn™ online

training on writing performance (as measured by genre elements included and length of opinion writing samples) of students with learning disabilities compared to their non-disabled peers?

3. What are students' perceptions of the acceptability of SRSD instruction?

The following secondary questions were addressed at the teacher level:

1. Does SRSD Writing to Learn™ online professional development impact experimental teachers' knowledge of SRSD?
2. What are experimental teachers' perceptions of SRSD Writing to Learn™ online professional development?

Research Design

A pretest-postest, cluster randomized control design was used to examine the effects of SRSD instruction on students' opinion writing performance. A cRCT allows entire groups, such as classrooms, to be randomly assigned to an experimental or control condition. This design enables a researcher to examine the effects of an intervention without the difficulty of assigning individuals to an experimental or control condition while maintaining the strength of random assignment (Bloom, Bos, & Lee, 1999). Murray (1998) outlines four distinguishing characteristics of cRCTs, (a) the units of assignment are intact groups; (b) each unit of assignment, or group, is assigned to a study condition; (c) the unit of observation is the members of the groups; and (d) a limited number of assignment units is included in each study condition, which is often fewer than 10 groups per study condition. In addition to the cRCT, teacher data is described to

determine how the PD affected teachers' knowledge of SRSD, as well as teacher perceptions of the SRSD Writing to Learn™ training.

Six teachers' classes were randomly assigned to an SRSD Writing to Learn™ training condition or a comparison condition. Writing to Learn™ classroom teachers participated in SRSD Writing to Learn™ training, then implemented SRSD instruction in their classroom to teach opinion writing. Teachers who were assigned to the comparison condition received no training and taught opinion writing according to their typical curriculum and instruction. All students' writing was assessed before and after opinion writing instruction. All students wrote an opinion essay in response to a writing prompt. Teachers in the comparison group were provided with access to the Writing to Learn™ training and research support once data collection for the study was complete.

While the primary questions and unit of analysis for efficacy of the training on students' achievement was student performance, teacher data were collected from SRSD Writing to Learn™ teachers to answer secondary research questions about teacher knowledge of SRSD and perceptions of SRSD Writing to Learn™ training. Writing instructional practices of teachers in the comparison group were determined by teachers' responses to a survey of writing practices and observation of writing lessons.

A pretest-postest cRCT was chosen because it allows intact groups to be assigned to conditions. Due to the independent variable of SRSD instruction following the Writing to Learn™ teacher training, it was more feasible to use each teacher's class rather than random assignment of students to classrooms since students are already assigned to classrooms by the school. Additionally, the use of a pretest-posttest design allows for

assessment of group performance before instruction to determine if selection bias occurred and will allow the pretest score to be used as a covariate in the analysis (Murray, 1998).

Variables

Variables are described as student variables and teacher variables. The student independent variable is opinion writing instruction delivered by teachers using the SRSD framework. Self-regulated strategy development lessons followed six stages of instruction: (a) develop and activate background knowledge, (b) discuss the strategy and introduce self-regulation procedures, (c) model the strategy, (d) memorize the strategy, (e) support the strategy through scaffolding, and (f) independent practice (Harris et al., 2008). Teachers taught lessons over approximately 3-4 weeks and used the framework flexibly to support students' mastery of skills. Two specific writing strategies were taught within the framework. First, a general planning strategy, POW, was taught: (a) Pick an idea, (b) Organize ideas, (c) Write and say more. The second strategy, TREE, is specific to opinion and persuasive writing. The steps are: (a) Topic sentence- Tell what I believe, (b) Reasons- Tell why I believe this. At least 3 reasons, (c) Ending- Wrap it up, (d) Examine- Do I have all the parts? The strategies used together will be referred to as POW + TREE. Dependent variables at the student level are pretest and posttest opinion writing samples and social validity surveys. Writing samples were scored for elements of opinion writing and length. Genre elements are (a) topic sentence, (b) reasons, (c) transition words or phrases, (d) reasons, (e) explanations, and (f) ending. The social validity survey

was the Children's Intervention Rating Profile. Length was scored number of words written as measured by Microsoft Word word-count tool.

The teacher independent variable was the SRSD Writing to Learn™ training. Dependent variables at the teacher level include, a pretest and posttest SRSD content knowledge assessment and a teacher perceptions of training survey. SRSD Writing to Learn™ training consists of professional development modules that are completed entirely online. The modules include videos of teachers who model each stage of SRSD, as well as reading material that provides background information, lesson materials, and access to support from SRSD Writing to Learn™. In addition to the online training, teachers participated in an in-person pretraining orientation session and a posttraining discussion and practice session. During the SRSD instruction period experimental teachers were provided with feedback on SRSD implementation, which consisted of the primary researcher sharing results of the observation checklist either in person or by email. Teachers also had the opportunity to reflect on their instruction using a self-monitoring checklist. SRSD Writing to Learn™ training included components of effective professional development including (a) is content focused; (b) incorporates active learning; (c) supports collaboration; (d) uses models of effective practice; (e) provides coaching and expert support; (f) offers feedback and reflection; and (g) is of sustained duration. The SRSD content knowledge assessment was a researcher developed assessment with questions that focused on teacher knowledge of stages of SRSD and components of each stage. The teacher perceptions survey was a Likert scale survey

completed online. Items focused on content relevance, online features, online participation, and transformational learning for instructional practice

Population

The population was teachers in four school districts in the southeastern United States who teach upper elementary writing in the general education setting and their students. Participants were selected using a multi-stage sampling design to gather a nonrandomized convenience sample based on accessibility to schools and classrooms. Schools were recruited from nearby school districts, and upper elementary teachers were recruited from within the schools. Once a school leader agreed for teachers at their school to participate in the study, teachers who taught writing to third, fourth, or fifth grade students in the general education setting were asked to participate. Teachers who agreed to participate were randomly assigned to either an SRSD Writing to Learn™ training group or a comparison group (no training provided).

Sample Size

A statistical power analysis was performed for sample size estimation based on guidance from Hedges and Rhoads (2009). The analysis indicated that six clusters of approximately 24 students (n = 192) was sufficient to detect meaningful effects with 75 - 95% power. The following sections describe the data and procedures used to estimate the sample size.

Power Analysis

Statistical dependencies within the clusters, or classes, must be taken into account when determining appropriate sample sizes for an cRCT to prevent overstatement of the

precision of the results and misleading estimates of effect sizes (Hedges & Rhoads, 2009). One approach to power analysis is to determine the minimum effect that can be detected (MDES) at a given power. Several design parameters are considered in the calculation of MDES, including the significance level, expected effect size, power, number of clusters, cluster size, and the extent of the clustering effect (intraclass correlation coefficient (ICC)) (Hedges & Hedberg, 2013). Various configurations of cluster number, cluster size, and covariates impact the MDES such that increases in the sample size without consideration of the arrangements of parameters may not increase power (Hedges & Hedberg, 2013; Hedges & Rhoads, 2009; Spybrook et al., 2011). For analyses that include covariates, the proportions of variance explained by each covariate are included in the calculation of MDES (Hedges & Rhoads, 2009). Multiple procedures and software are available to determine MDES. Two software programs, described in Hedges and Rhoads (2009), were used to determine sufficient number of clusters and cluster sizes for the current study: *Optimal Design Plus Empirical Evidence* (Version 3.0) and *Power and Precision* (Version 4). Each program includes the application of the previously described design parameters (i.e., significance level, expected effect size, power, cluster size, ICC, and proportions of variance explained by the covariate for both within group variation and between group variation). First, a description of each design parameter is provided then the procedures and results of each software are described.

Design Parameters

Significance level. A significance level of .05 was used in the MDES calculation. A significance level of .05 indicates the probability of a Type I error, or rejecting the null

hypothesis when it is true (Shadish, Cook, & Campbell, 2002). A significance level of .05 is often used in educational research (Hedges & Rhoads, 2009; Shadish et al., 2002).

Expected effect size. When calculating the MDES, it is possible to explore configurations of the number of clusters and the number of students in clusters to determine a range of MDES. A mean effect size of 0.73- 0.90 for opinion genre elements has been shown to be statistically significant in studies of PBPD for SRSD (Festas et al., 2015; Mason et al., 2017). Various configurations of clusters and cluster sizes were explored to determine which configuration would allow for an effect size between 0.70 and 0.90 to be detected. Table 3 provides values used in the calculation.

Power. The application of MDES to determine sample size requires that a level of power be specified. This level indicates the chance of finding an intervention effect if an effect is present (e.g., rejecting the null hypothesis when an effect of treatment occurred) (Hedges & Rhoads, 2009; Shadish et al., 2002). A power level of .80 is often determined to be sufficient in education research (Hedges & Hedberg, 2013; Spybrook et al., 2011) and was used in the MDES calculations.

Cluster size. Cluster size was determined based on data from the South Carolina Department of Education 2017 State Report Card (South Carolina Department of Education, 2018). Student-teacher ratios in core subjects were examined for three neighboring school districts. Ratios ranged from 23 to 24 students per teacher.

ICC. The ICC is a statistical measure of the correlation among participants in the same cluster (Hedges & Rhoads, 2009). Students who are members of the same cluster are often more alike than students in other clusters (Hedges & Hedberg, 2007; Hedges &

Rhoads, 2009). Literature supports that an estimate of the ICC may be obtained through pilot study data, previous research, or articles that present ICC data (Hedges & Hedberg, 2007; Hedges & Hedberg, 2013). Due to a lack of pilot study data or previous literature to provide an estimate of ICC, estimates were obtained from literature that present ICC data. Hedges and Hedberg (2013) include tables of school and district level ICC values and covariate effectiveness for reading and mathematics achievement purposed for the planning of cRCT. Data are arranged in tables by states; however, South Carolina is not included. North Carolina data were used to estimate values due to its proximity to South Carolina. Additionally, ICC values for writing are not available in the literature; thus reading data were used to estimate values for use in the MDES calculation. ICCs based on reading are shown to be a reasonable estimate of writing ICCs because skills of reading and writing are strongly related (Fitzgerald & Shanahan, 2000). A similar method of estimating ICCs has been in use peer-reviewed meta-analyses of writing intervention studies to adjust effect sizes from studies that did not account for grouping or clustering in the original effect size calculation (Graham et al., 2015; Graham et al., 2012b). Although the student includes third, fourth, and fifth grade students, fourth grade student data from Hedges and Hedberg (2013) was used because all grades could not be entered and fourth is in the middle of third and fifth.

Proportions of variance explained by the covariate for both within group variation and between group variation. As described in the previous section, Hedges and Hedberg (2013) provide values that correspond to the variance explained by a covariate of pretest scores at level-1 and level -2 of a cRCT. Based on information for

Grade 4 in North Carolina, the variance of level-1 means explained by pretest scores is 0.61, and the variance of level-2 means explained by pretest scores is 0.92 (Hedges & Hedberg, 2013).

Table 3
Values Used in Power Analysis Calculations

	Sig.	Expected effect size	Power	Cluster size	Number of clusters	ICC	Proportions of variance explained by the covariate for level-1	Proportions of variance explained by the covariate for level-2
Value	0.05	0.70 0.80 0.90	0.80	24	6 7 8	0.15 0.20	0.61	0.92

Note: ICC = intraclass correlation

Calculation

Optimal Design Plus Empirical Evidence. MDES calculations were conducted with *Optimal Design Plus Empirical Evidence* (Version 3.0), which is a software that determines MDES by a given number and size of treatment groups (Spybrook et al., 2011). To complete the power analysis, a pretest score for both intervention and comparison groups to serve as a level-1 covariate for individual performance and a level-2 covariate for class mean performance was considered. Information entered in the software is presented in Table 3. Based on the MDES analysis, six clusters of approximately 24 students (n = 144) will allow for a MDES of between 0.70 and 0.90 to be detected with 75 - 90% power (Figure 1), while eight clusters of approximately 24

students (n = 192) would allow for an MDES of 0.7 to 0.90 to be detected with 94-100% power. (Figure 2).

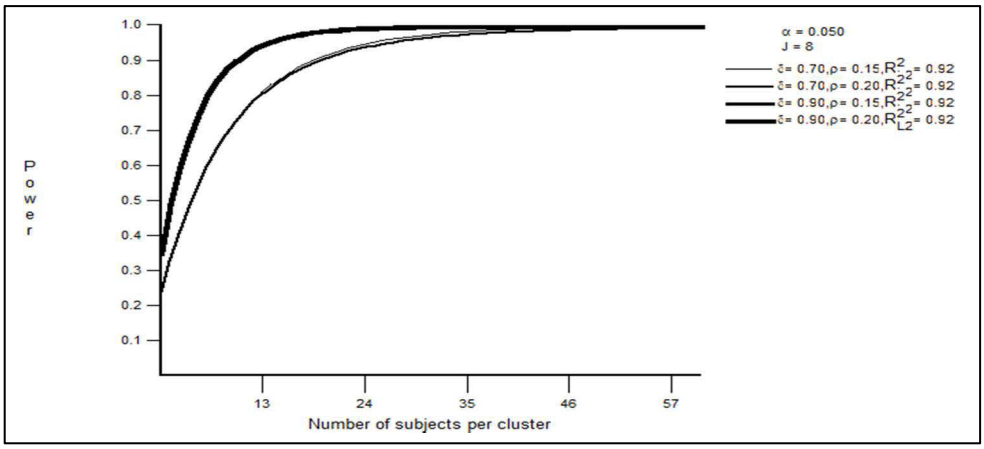

Figure 1. Optimal Design Power Analysis for Eight Clusters

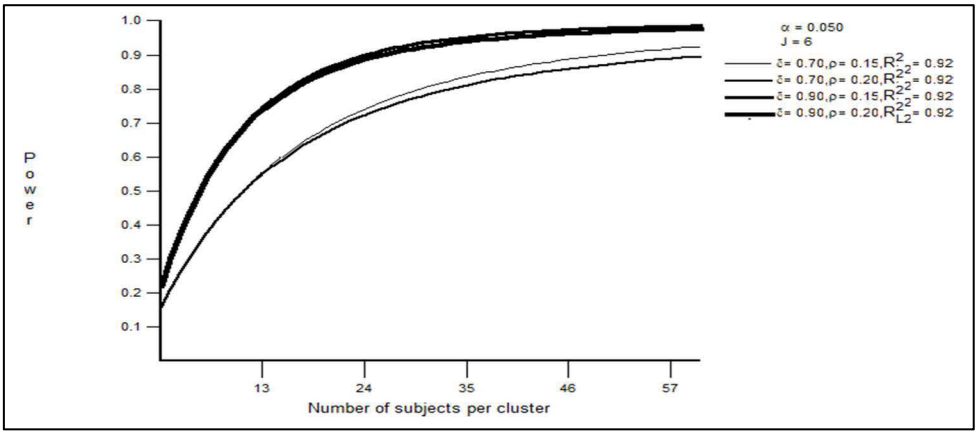

Figure 2. Optimal Design Power Analysis for Eight Clusters

The range of power for each number of clusters is dependent on the ICC used in calculation. While six clusters will result in a higher effect size being detectable at 75-80% power, eight clusters would allow for large effect sizes to be detected with up to 100% power.

Table 4

Power and Precision Power Analysis

Scenario	*d*	ICC	Classes exp	Classes cntrl	Students exp	Students cntrl	Covariates (W) Number	Covariates (W) R2	Covariates (B) Number	Covariates (B) R2	Alpha	Tails	Power
1	0.9	0.2	3	3	24	24	1	0.92	1	0.61	0.05	1	0.89
2	0.8	0.2	3	3	24	24	1	0.92	1	0.61	0.05	1	0.83
3	0.7	0.2	4	4	24	24	1	0.92	1	0.61	0.05	1	0.91
4	0.9	0.15	3	3	24	24	1	0.92	1	0.61	0.05	1	0.95
5	0.8	0.15	3	3	24	24	1	0.92	1	0.61	0.05	1	0.90
6	0.7	0.15	3	3	24	24	1	0.92	1	0.61	0.05	1	0.83

Note. cntrl = control, exp = experimental, B = between, ICC = intraclass correlation, W = within

Power and Precision. Hedges and Rhoads (2009) describe software from Borenstein, Rothstein, and Cohen (2001), *Power and Precision* (Version 4), which allows the user to enter parameter information and provides the appropriate number of clusters needed based on parameters entered. Based on the analysis, six clusters of approximately 24 students (n = 144) will allow for an MDES of between 0.7 and 0.9 to be detected with 83% - 95% power. Table 4 provides each scenario given the different levels of effect size and ICC specified. Information entered in the software was: alpha level (0.05), number of students (24), power (0.7, 0.8, 0 .9). The difference in outcomes of the two software programs (Optimal Design vs. Power and Precision) is likely because Power and Precision incorporates the impact of the pretest covariate on both level-1 and level-2 variance while Optimal Design includes only level-2 covariates. Based on both software programs, six classes with approximately 24 students

each is an appropriate sample and configuration to detect large effects; however, eight classes with 24 students is also appropriate. Six classes were used rather than eight due to availability of teacher participants.

Participants

Teacher participants were 6 upper elementary school teachers (e.g., two third grade, two fourth grade, two fifth grade) who each taught two sections of English language arts. Teachers voluntarily participated in the study and provided written consent prior to participation. Teachers were then randomly assigned to the experimental or comparison condition.

Experimental Teachers

Teachers assigned to the experimental condition all held degrees in elementary education. Teacher A taught 3rd grade. She held a master's degree. Her age was in the 50 or older range. Her years of experience teaching third grade were between 6 - 8 years. Teacher B taught fourth grade. She held a bachelor's degree. Her age was between 31-40. Her years of experience teaching fourth grade were between 3 - 5. Teacher C taught fifth grade. He held a bachelor's degree. His age was between 25 - 30. His years of experience teaching fifth grade were between 3 - 5.

Comparison Teachers

Teachers assigned to the comparison condition all held degrees in elementary education. Teacher D taught third grade. She held a bachelor's degree. Her age was between 31 - 40. Her years of experience teaching third grade was between 9 - 11 years. Teacher E taught fourth grade. She held a master's degree. Her age was between 25 - 30.

Her years of experience teaching fourth grade was between 0 - 2. Teacher F taught fifth grade. She held a bachelor's degree, her age was between 25 - 30 years, and her years of experience teaching fifth grade was 3 - 5.

Students

A total of 186 students (102 in the experimental group and 84 in the comparison group) participated in the study (see Table 5). Initially 200 students provided consent. Although all students participated in the writing assessments as part of classroom assessments, 14 (3 in the experimental group, 11 in the comparison group) students did not complete both the pretest and posttest (some students were not present during both tests, while some changed schools).

Students in the experimental group were in Grade 3 (n = 35), Grade 4 (n = 36), and Grade 5 (n = 31). The age of the experimental group ranged from 9 to 12 (M = 10.48; SD = 1.06). Student races were: African American (n = 6), Caucasian (n = 79), Hispanic (n = 12), mixed races (n = 4), and Pacific Islander (n = 1). Over half of students (58.8%) in the experimental group received free or reduced lunch. Of the 14 students identified with disabilities, 7 had SLD.

Students in the comparison group were in Grade 3 (n = 33), Grade 4 (n = 29), and Grade 5 (n = 22). The age of the comparison group ranged 9 to 13 (M = 10.32; SD = 1.00). Student races were: African American (n = 4), Asian (n = 1), Caucasian (n = 69), Hispanic (n = 7), and mixed races (n = 3). A majority of students (61.9%) in the comparison group received free or reduced lunch. Of the 10 students identified with disabilities, 6 had SLD.

Setting

The study took place in a Title 1 elementary school in the Southeastern United States. The school's student body is composed of approximately 3% African American, 0.01% Asian, 86% Caucasian, 7% Hispanic, .01% Pacific Islander, and 4% mixed races. Seventy-one percent of the student population is considered to be in poverty, 13% of students are classified as students with disabilities, and 4% are classified as having limited English proficiency.

Instrumentation

Demographic data were collected from all teacher and student participants. Teachers completed a demographic survey (Appendix A). Student demographic

Table 5

Student Demographic and Descriptive Data

	Experimental group (n = 102)		Comparison group (n = 84)	
Demographic/descriptive data	n	%	n	%
Gender				
Female	54	53%	41	49%
Male	48	47%	43	51%
Grade				
Third	35	34%	33	39%
Fourth	36	35%	29	35%
Fifth	31	30%	22	26%
Disability Status				
No disability	85	83%	72	86%
AU	1	1%	0	0%
LD	7	7%	6	7%
OHI	2	2%	0	0%
SI	4	4%	3	4%
VI	0	0%	1	1%
504 plan	3	3%	2	2%

Note. AU = autism, LD = specific learning disability, OHI = other health impairment, SI = speech or language impairment, VI = visual impairment

information was provided in a password protected Excel file by the data manager at the school. Teachers completed surveys of writing practices following assignment to experimental or control conditions. Experimental teachers were requested to complete a SRSD knowledge assessment prior to receiving Writing to Learn™ training and after Writing to Learn™ training. Two of the three teachers completed the SRSD knowledge assessment prior to training, while all three teachers completed the knowledge assessment following training. Student data were gathered through student writing samples given before opinion writing instruction and after opinion, and student social validity surveys were given following SRSD instruction.

Student Measures

Writing outcomes. All students completed an opinion-writing sample before and after opinion writing lessons. Researchers were provided with writing prompts and administration scripts for the administration of pretest and posttest measures. All pretests were administered within the same week, and after instruction in opinion writing, researchers administered writing posttests within a two-week period. Writing prompts were used in previous research (Graham et al, 2005; Harris, Graham, & Mason, 2006; Harris et al., 2012b) and resulted in similar outcomes of length and quality when used with elementary students (Graham et al., 2005; Harris, Graham, & Mason, 2006). The pretest writing prompt was, "Should parents make children your age clean their rooms?" The posttest writing prompt was "Should children your age be allowed to choose their own pets?". Students were provided with IEP or 504 accommodations (i.e., assessment in

a small group) (Mason et al., 2017). Because the directions and prompt were read aloud and students received unlimited time, the only accommodation that was required to be provided was testing in a small group. As in previous SRSD research for opinion writing instruction of elementary students, there was no time limit for writing (Graham et al., 2005; Harris et al., 2006; Mason et al., 2017).

Elements. Each essay was scored for elements of opinion writing. The scoring rubric used in the study was adapted from rubrics provided by SRSD Writing to Learn™ OPD and was similar to rubrics used in other SRSD studies (Festas et al., 2015; Harris et al., 2012a; Harris et al., 2012b; Mason et al., 2017). Students could score a maximum of 16 points based on inclusion of: (a) topic sentence, (b) reasons, (c) transition words or phrases, (d) reasons, (e) explanations, and (f) ending.

Length. The length of each essay was determined by counting the number of words written. A researcher used the word count tool in MS Word to determine the length of each writing sample.

Scoring. As in previous SRSD research, all essays were typed into a Microsoft word document with student identification removed and with spelling, capitalization, and punctuation errors corrected (Harris et al., 2012a; Harris et al., 2012b; Harris et al., 2015; Festas et al., 2015). Typing and correction of errors seeks to avoid influences of surface level features (e.g., handwriting, spelling, punctuation) on scorers' judgments of quality (Graham, 1999; Graham, Harris, & Hebert, 2011). A second researcher checked the typed essay copy against the original handwritten copy of 30% of typed essays to assess reliability of typing. The primary research scored all essays. Then a member of the

research team who was unfamiliar with the study and research conditions was trained to score writing samples using the genre element criteria. The primary researcher provided the scorer with a scoring rubric and modeled how to score essays using the rubric (see Appendix L). They then practiced scoring essays until the scorer reached 95% agreement or higher with primary research scored essays, over 10 essays (Mason et al., 2017). The scorer scored one-half of essays (Harris et al., 2006; Harris et al., 2015), so that one-half of the essays were scored twice. All scores were entered in an Excel spreadsheet, and student ID numbers were used to identify student scores. The scorer was a doctoral student in education who was compensated for her work.

Social Validity. Students completed the Children's Intervention Rating Profile (CIRP) (see Appendix I), a 15-item Likert survey. The CIRP asks children to rate their agreement with statements regarding perceived acceptability and usefulness of the instruction. Survey questions were read aloud to students, and students completed the surveys on paper. Responses were entered into a Excel spreadsheet. Student's names were removed and assigned student ID numbers were used to identify the respondent.

Teacher Measures

Writing practices measure. Prior to OPD training and opinion writing instruction, all teachers completed the Survey of Classroom Writing Practices (Cutler & Graham, 2008) to describe typical classroom writing practices. The survey consists of two sections: (a) 41 Likert-scale questions, and (b) description of writing practices related to strategy instruction for writing. The survey provided information about how often teachers teach specific skills or use specific teaching practices. The survey was

administered online through Qualtrics. Each teacher's identification number identified survey responses.

Teacher knowledge assessment. The teacher knowledge measure was administered to SRSD Writing to Learn™ teachers through Qualtrics before and after SRSD Writing to Learn™ instruction. The posttest was administered approximately three months after the completion of SRSD Writing to Learn™ training. Each teacher was given a unique identification number to use when completing the assessment.

The SRSD content knowledge assessment was adaptive in that it required teachers to answer questions to a certain level before moving on to the next level. For example, if a teacher was unable to identify stage one of SRSD, the teacher was not asked to identify the instructional components in stage one. This design ensured that information in subsequent questions did not influence teacher answers. Because no prior research of PD for SRSD has measured teacher content knowledge, the SRSD knowledge measure was developed by the researcher. The SRSD knowledge measure was aligned with SRSD Writing to Learn™ content and was constructed to determine if teachers could identify each stage of SRSD, and if they could identify what teachers should do at each stage of SRSD. Teachers received points for identifying the stage and points for each specific indicator that they describe for that stage. Teachers could score up to 40 points on the SRSD knowledge assessment (see Appendix C for a copy of the assessment).

Teacher perceptions measure. Teachers completed a Likert-style survey to determine the acceptability of the professional development. Teachers completed the

survey online through Qualtrics. Teachers ID numbers were used to identify teachers' data.

The survey questions were designed to determine the acceptability of the SRSD Writing to Learn™ training, including duration, organization, and presentation of training. Teachers also reported characteristics of participation including actual hours spent in training modules. The survey was adapted from Collins and Liang (2015), and Reeves and Pedulla (2013). As currently written, the Collins and Liang survey (2015) contains items that have adequate internal consistency demonstrated by high reliability (α = .86 - .93) for the composites of teacher-reported student achievement, coherence, clarity of goals and expectations, and computer proficiency. The current survey consisted of 18 questions with a maximum Likert scale score of 90 (see Appendix D).

Procedures

Recruitment

Participants were recruited through emails sent to district instructional leaders in three school districts in South Carolina. The instructional leaders identified schools that might be willing to participate and that would benefit from the SRSD Writing to Learn™ PD. School leaders were then contacted, and meetings were scheduled to share details of the study. School leaders provided names and contact information for teachers to recruit for study participation. The teachers were contacted, and meetings were held to share details of the study. One principal was interested in the third, fourth, and fifth grade ELA teachers participating in the study. Because the sample at that school was large enough to

meet the requirements given in the power analysis, the study was conducted at one school.

Consent and Assent

Following procedures required from the Clemson University Institutional Review Board (IRB), and the school district's IRB, teachers were provided written consent for participation in the study. Students were asked to give assent to participation, and parent/guardian consent forms were sent home with students so parents or guardians could provide consent to student participation.

Randomization

Teachers were randomly assigned to either the SRSD Writing to Learn™ or comparison condition. Randomization took place by entering all teacher names into an Excel file and assigning a random number to each name. The file was sorted according to order of the random numbers. The first half of the random numbers (lowest to mid) was assigned to the comparison condition, and the second half (mid to highest) was assigned to the SRSD Writing to Learn™ condition (See Hutchison & Styles, 2010).

Initial Surveys

Once teachers provided consent and were randomly assigned to treatment groups, teacher writing practices surveys, SRSD knowledge assessments, and demographic surveys were completed online. Teachers completed surveys online through Qualtrics during the time that researchers administered the student writing pretests. Each teachers was assigned a unique ID number and all survey information was identified by the teacher ID rather than the teachers' names. All data were stored in a password-protected account.

Writing Prompt Administration

Researchers administered writing pretests within the same week. In each experimental and comparison classroom, a researcher read and applied administration directions while teachers completed online surveys. Researchers collected all student materials and placed them in an envelope. Essays were then labeled with student ID numbers, and cover sheets that contained student names were removed and stored separately. Posttest were administered within a two-week period. Time of administration varied due to experimental and comparison classrooms completing opinion writing lessons and varying times. In each experimental and comparison classroom, a research read and applied administration directions. Researchers collected all student materials and placed them in an envelope. Essays were then labeled with student ID numbers, and cover sheets that contained student names were removed and stored separately. See Appendices E, F, G, and H for prompts and prompt administration script.

Instruction

Comparison Condition

Teachers in the comparison condition attended a 1-hour meeting for orientation to the study. They were asked to refrain from teaching opinion writing topics until the beginning of the instructional period in which all teachers in the study would teach opinion writing. Comparison teachers were notified of the anticipated timeline for when the instructional period would begin based on when experimental teachers completed SRSD Writing to Learn™ training. Comparison teachers taught opinion writing during

the instructional period in which experimental teachers provided opinion-writing instruction. Once all data collection was complete, comparison teachers were provided with access to the Writing to Learn™ training and researcher support to implement SRSD instruction. Comparison teachers did not complete the training or seek assistance during the current school year, but teachers discussed completing the training over the summer and implementing SRSD instruction the following school year.

Writing instruction. Teachers in the comparison condition completed a survey to describe their typical writing instruction, and two opinion writing lessons were observed by researchers. Teachers in the comparison group taught an average of 13, 30-minute writing lessons during the study.

Survey of classroom writing practices. No teachers reported teaching students to plan and write opinion essays, to set goals for writing, nor to self-assess writing. Two teachers reported teaching students to use self-statements by using thinking stems for particular content areas, or using words to solve disagreements during group discussions.

Observation of opinion writing lessons. Two 30-minute lessons from each comparison teacher were observed to provide a description teachers' writing instruction and whether elements of SRSD were included in the comparison teachers' lessons. Although an observation of all comparison teachers' lessons would have provided a more thorough description of the comparison setting, two observations surpass assessment of instruction in the comparison setting in similar studies of PD for SRSD. Studies have either collected no data on comparison classrooms (Mason et al., 2017) or collected survey data of writing instruction only (Festas et al., 2015). The teacher observation of

classroom writing practices measure (Graham, Harris, Fink-Chorzempa, & MacArthur, 2003) contained two sections (see Appendix K). Section one included items related to skills and strategies taught (9 items), common instructional activities in process writing (12 items), instructional and assessment procedures (10 items), alternative modes of writing (2 items), and other (activities completed by the teachers or students not listed). Section two (7 items) included items related specifically to strategies instruction for opinion writing.

Teachers taught a specific opinion writing strategy; the OREO strategy is a mnemonic for remembering opinion, reasons, explanations, restate opinion. All teachers in the comparison condition were observed to provide modeling, guided practice, and independent practice in the use of the OREO strategy for opinion writing. Posters of the OREO strategy were displayed in the classrooms. Students were also provided with instruction on revising and editing, which included determining if all parts of OREO were included in student essays. Teachers in the comparison condition were not observed to teach students to use self-statements, set goals for writing, nor graph progress.

Intervention Condition

Teachers assigned to the intervention condition attended a 2-hour orientation session. During the meeting, teachers were provided with SRSD Writing to Learn™ access codes, an overview of the training, and a log to track time spent on PD. The SRSD Writing to Learn™ access code was not valid until after the both teachers' and students' pretests were completed. Teachers were asked to complete the SRSD Writing to Learn™ modules within a week and download lesson materials provided in the modules for

classroom use. After one week, teachers met again to participate in discussion questions from SRSD Writing to Learn™ and practice components of lessons. Teachers were also provided an opportunity to ask questions regarding lesson implementation. As in previous studies of PD for SRSD, teachers were provided with support throughout lessons in the form of researcher availability for questions and feedback following observations (Harris et al., 2012b; Festas et al., 2015). Teachers completed teacher SRSD knowledge assessment pretests online while researchers administered pretests to students. Teachers were provided with a lesson-pacing guide to help guide progression through the lessons (Harris et al., 2012a; Harris et al., 2012b). Teachers taught an average of 20, 30-minute writing lessons. Teachers completed the SRSD knowledge assessment posttest independently approximately three months following Writing to Learn™ training.

SRSD Writing to Learn™ training. Teachers went to the website training website (e.g., https://course.SRSDWritingtoLearn.com/courses/srsd-elearning-k-8/) and entered their username and password that was supplied to them during the in-person orientation meeting. They worked independently and asynchronously to complete seven modules: (a) SRSD Online Course Overview and Introduction K-6; (b) Stage 1: Develop and Activate Background Knowledge K-6; (c) Stage 2: Discuss It K-6; (d) Stage 3: Model It K-6; (e) Stage 4: Memorize It K-6; (f) Stage 5: Support It K-6; and (g) Stage 6: Independent Performance K-6. Each module contained reading material, videos, quizzes, and downloadable resources for classroom use. Teachers participated in training for opinion writing at grades 3-5 as their genre and grade level focus.

SRSD lesson instruction. Teachers used materials from the training to create

opinion-writing lessons that followed the SRSD framework for instruction. A general description of each stage that teachers implemented is given below; however, teachers designed lessons and chose materials. For example, the training materials included example paragraphs and prompts to use during lessons. Teachers chose which model paragraphs to present to students or which writing prompts to use within lessons. The general descriptions of each stage are summarized from Harris et al. (2008).

Stage 1: Develop and activate background knowledge. During this stage, the teacher ensures that students have the background knowledge, or prerequisite skills needed to apply the writing strategy. The writing strategy that all teachers in the intervention group used is POW + TREE (Pick my idea, organize my notes, write and say more + topic, reasons, ending, examine). The teachers provided an overview of the POW + TREE and introduced the self-regulation strategies to be explicitly taught throughout the SRSD stages (Harris et al., 2008; Mason, Reid, & Hagaman, 2012). The self-regulation strategies that each SRSD Writing to Learn™ teacher taught were self-instruction, self-assessment, self-monitoring, self-reinforcement, and self-graphing.

Stage 2: Discuss it. The purpose of this stage is to generate students' enthusiasm and understanding of the importance of the writing strategy. Due to the focus on the student's role in self-regulation techniques, students were asked to commit to using the strategy and the self-regulation techniques. The teacher provided students with information regarding their present level of performance, which was the scored pretest writing sample. Students used the information to set their own goals for learning and performance.

Stage 3: Model It. During this stage, the teacher modeled POW + TREE and self-regulation strategies using a "think aloud" technique. Teachers modeled the use of self-statements and self-instruction during planning, writing, and graphing. The teacher used all materials that students would use (i.e., graphic organizers, charts) to model the application of each tool while writing. After modeling, the teacher discussed with students the self-statements that were used and the importance of self-statements. Students began to create and record their self-statements for future use.

Stage 4: Memorize it. During this stage, students memorized the steps of POW + TREE. Although activities for memorizing may take place throughout all previous lessons, during this stage teachers assessed students to determine if they had learned the steps. Activities to assist in memorization, such as songs, matching games, or partner quizzing took place during this stage.

Stage 5: Support it. During this stage, the students practiced using POW + TREE and self-regulation strategies with scaffolded teacher support. The teacher used collaborative writing, prompts for next steps, and frequent guidance. As students became more independent in applying the POW + TREE and self-regulation strategies, the teacher faded support until the student could apply the strategies independently.

Stage 6: Independent performance. During this stage, students used the POW + TREE independently. Visual aids, such as charts, were not used at this stage, as students should have internalized the strategy. Teachers continued to monitor students to determine the strategy effectiveness and student performance.

Lesson Fidelity and Observation

Thirty-three percent of SRSD Writing to Learn™ teachers' lessons were observed and video recorded so that instruction could be scored for implementation of components of SRSD. Implementation scores were based on the elements that should be included in each stage of SRSD. Videos of lessons were stored in a password protected external hard drive.

A member of the research team observed 33% of SRSD lessons, spanning the beginning, middle, and end of the lesson sequence. A fidelity checklist form was used to document SRSD components included in the lesson (See Appendix J for an example checklist). A second observer observed and rated the lessons (Festas et al., 2015; Harris et al., 2012b). Before conducting observations, observers were trained to use the fidelity forms with practice videos until they were able to observe and rate lessons using the tool with a high level of interrater agreement (95-100%). Observers were doctoral students in education who were compensated for their work.

Analysis

Primary Questions

Question 1. What is the effect of SRSD writing instruction provided by upper elementary teachers who have completed SRSD Writing to Learn™ online training compared to writing instruction by upper elementary teachers in a business-as-usual comparison group on students' writing achievement on opinion writing samples as measured by: (a) the number of genre elements included in students' opinion writing samples and (b) the length of students' opinion writing samples?

Analysis of Question 1. SPSS (version 26) was used to conduct a mixed-model analysis of covariance (ANCOVA) in two stages (Murray, 1998). ANCOVA is useful to compare the difference between two groups while controlling for a covariate, such as a pretest score. Two stages of analyses take into account both group and individual variation to prevent results from an inflated Type I error rate as can be found in analyses that ignore group variation (Murray, 1998). Furthermore, ANCOVA allows for greater control by partitioning out variance related to the covariate and error variance (Hinkle, Wiersma, & Jurs, 2003).

Length. The first stage of the analysis consisted of using ANCOVA to compute adjusted group means using pretest scores as a covariate for scores for each student. A second ANCOVA to assess the treatment effects using the adjusted group means from stage one and the group pretest mean as a covariate (Murray, 1998) was proposed; however, upon checking assumptions of ANCOVA, several assumptions were violated. Specifically, standardized residuals were not normally distributed, as assessed by Shapiro-Wilk's test ($p <$ .05). Also, the assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p < .05$). Finally, for number of words written there was not homogeneity of regression slopes as the interaction term was statistically significant. ANCOVA is robust to violations of normality and homogeneity of variances; however, because the assumption of homogeneity of regression slopes was not tenable an independent samples t-test was conducted in the second stage because a t-test would allow the analysis to be conducted without the covariate.

A significance level of .05, which is often used in educational research (Hedges & Rhoads, 2009; Shadish et al., 2002), was used to for decision-making regarding the null hypothesis. Descriptive statistics are reported for the pretest and posttest (*M, SD*) and adjusted pretest and posttest (*M, SD*). Additionally, the number (*N*), the number per group (*n*), and the degrees of freedom are reported. The effect size, *d*, is reported and interpreted using Cohen's (1988) guidelines for interpreting effect size (0.20 = small effect, 0.50 = medium effect, ≥ 0.80 = large effect).

Although ANCOVA is appropriate to compute adjusted scores, the adjusted data must be analyzed to determine if the assumptions of independent t-test are met for further analysis to be meaningful (Hinkle et al., 2003). Specifically, tests of (a) independence, (b) normality, and (c) homogeneity of variance, (Hinkle et al., 2003).

Independence. The assumption of independence was met by using the group-adjusted means of each group (e.g., intervention, comparison) as the unit of analysis. Group mean scores for the intervention group was independent of group mean scores of the comparison group.

Normality. The Shapiro-Wilk test for normality was used due to its precision with smaller sample sizes and power to detect deviations from normality over other common methods test for normality. A significance level of greater than .05 indicates that the assumption is tenable (Pituch & Stevens, 2016). Violations of normality are reported; however, t-test is robust to violation of normality when sample sizes are sufficient and equal (Hinkle et al., 2003).

Homogeneity of variance. Levene's Test of Equality of Variance was used to determine whether the variances of the distribution are equal. A significance value of .05 or less indicates that equal variance cannot be assumed. Violations of homogeneity of variances are reported; however, and if violations are present, a Welch t-test is used (Pituch & Stevens, 2016).

Question 2. What are the differential effects of SRSD instruction provided by upper elementary teachers who have completed SRSD Writing to Learn™ online training on writing performance (as measured by genre elements included and length of opinion writing samples) of students with learning disabilities compared to their non-disabled peers?

Analysis of Question 2. Descriptive statistics (i.e., mean, standard deviation) were calculated to determine the writing performance of students with SLD at pretest and posttest, as well as the change in scores from pretest to posttest.

Question 3. What are students' perceptions of the acceptability of SRSD instruction?

Analysis of Question 3. To determine students' perceptions of SRSD for opinion writing, descriptive statistics were calculated for each question. Histograms were created for the set of questions to determine which aspects of SRSD students found to be least and most acceptable.

Secondary Questions

Question 1. How does SRSD Writing to Learn™ online professional development change experimental teachers' knowledge of SRSD?

Analysis of Questions 1. Pretest and posttest scores were calculated to determine teachers' knowledge of SRSD at pretest and posttest, as well as the change in scores from pretest to posttest. Questions were examined to determine if a pattern existed in the types of questions teachers answered correctly or incorrectly.

Question 2. What are experimental teachers' perceptions of SRSD Writing to Learn™ online professional development?

Analysis of Question 2. To determine teachers' perceptions of SRSD Writing to Learn™ for professional development, descriptive statistics were calculated for each question. Histograms were created for the set of questions to determine which aspects of SRSD Writing to Learn™ teachers found to be least and most acceptable.

Summary

Prior to participation teachers were randomly assigned to treatment and comparison conditions, with students nested under classroom. Teachers in the intervention group completed SRSD Writing to Learn™ training prior to implementation of the intervention. All student participants' opinion writing performance was assessed at pre- and post-intervention. Pretest and posttest scores are reported in Table in Chapter 4. Students in the experimental classes also provided feedback regarding their acceptability of SRSD instruction. Results are reported in Table 8 in Chapter 4. Experimental teachers' knowledge of SRSD was assessed prior to and after completion of SRSD Writing to Learn™ training. Pretest and posttest scores are reported in Chapter 4. Experimental teachers' perceptions of SRSD Writing to Learn™ training were assessed after their completion of the training. Results are reported in Tables 9, 10, and 11 in Chapter 4.

Chapter 4

Results

The primary purpose of this study was to determine the effects of self-regulated strategy development (SRSD) instruction on the writing performance of upper elementary students whose teachers received SRSD Writing to Learn™ online training. The effectiveness of SRSD instruction based on students' classification as SLD and students' perceptions of the SRSD instruction acceptability was also assessed. A secondary purpose of this study was to determine how online professional development (SRSD Writing to Learn™ training) changes teachers' knowledge of SRSD. Teacher acceptability of the online training was also assessed. The following primary research questions were addressed at the student level:

1. What is the effect of SRSD writing instruction provided by upper elementary teachers who have completed SRSD Writing to Learn™ online training compared to writing instruction by upper elementary teachers in a business-as-usual comparison group on students' writing achievement on opinion writing samples as measured by: (a) the number of genre elements included in students' opinion writing samples and (b) the length of students' opinion writing samples?
2. What are the differential effects of SRSD instruction provided by upper elementary teachers who have completed SRSD Writing to Learn™ online training on writing performance (as measured by genre elements included

and length of opinion writing samples) of students with learning disabilities compared to their non-disabled peers?

3. What are students' perceptions of the acceptability of SRSD instruction?

The following secondary questions were addressed at the teacher level:

1. Does SRSD Writing to Learn™ online professional development impact experimental teachers' knowledge of SRSD?
2. What are experimental teachers' perceptions of SRSD Writing to Learn™ online professional development?

This chapter includes the results of the study divided into student-level results and teacher-level results. Student-level results include (a) writing performance for students in treatment and comparison groups, (b) writing performance for students with specific learning disabilities, and (c) social validity. Teacher-level results include (a) teacher knowledge, (b) survey of classroom writing practices, and (c) teacher perceptions of online training.

Student-level Results

Writing achievement. To determine the effect of SRSD writing instruction provided by upper elementary teachers who completed SRSD Writing to Learn™ online training compared to writing instruction by upper elementary teachers in a business-as-usual comparison group on students' writing achievement, writing samples were scored for: (a) the number of genre elements included in students' opinion writing samples, and (b) the length of students' opinion writing samples. IBM SPSS Statistics (Version 26)

was used to conduct a mixed-model analysis of covariance (ANCOVA) in two stages (Murray, 1998).

Elements of opinion essays. The first stage of the analysis consisted of using ANCOVA to compute adjusted group means using pretest scores as a covariate for scores for each student. There were six clusters (e.g., classes). Class 1 (n = 31, M= 12.52 , *adj M* = 11.81), Class 2 (n = 35, M= 8.49, *adj M* = 9.24), Class 3 (n = 104.72, M= 13.11, *adj M* = 13.24), Class 4 (n = 29, M= 5.52, *adj M* = 5.47), Class 5 (n = 22, M= 8.82 , *adj M* = 7.31), Class 6 (n = 33, M= 7.24, *adj M* = 8.20).

During the second stage of analysis, assumptions of t-test were checked using adjusted group posttest means from stage 1. Assumptions of t-test including one dependent variable measured at the continuous level, one independent variable with two categorical and independent groups, and independence of observations were met by study design. There were 102 (M = 11.43, SD = 1.70) students in the experimental classes and 84 students in the comparison classes (M = 7.02, SD = 1.19). A Welch t-test was performed to determine if there were differences in the mean number or elements of opinion essays between experimental and control classes due to the assumption of homogeneity of variances being violated, as assessed by Levene's test for equality of variances (p = .00). No outliers were found in the data, as assessed by inspection of a boxplot. The assumption of normality was not found to be tenable, as assessed by Shapiro-Wilk's test ($p < .05$); however t-test is robust to violations of normality. Students in experimental classes included more elements of opinion essays in their writing (M = 11.43, SD = 1.70) than students in comparison classes (M = 7.02, SD = 1.19), a

statistically significant difference, *M*= 4.41, 95% CI [3.99 to 4.83], t (179.71) = 20.78, *p* = .00. Large effects were observed on elements of opinion essay included in students' writing (*d* = 0.86).

Length. The first stage of the analysis consisted of using ANCOVA to compute adjusted group means using pretest scores as a covariate for scores for each student. There were six clusters (e.g., classes). Class 1 (*n* = 31, *M*= 129.23, *adj M* = 112.59), Class 2 (*n* = 35, *M*= 129.23, *adj M* = 84.95), Class 3 (*n* = 104.72, *M*= 104.72, *adj M* = 103.76), Class 4 (*n* = 29, *M*= 68.21, *adj M* = 69.06), Class 5 (*n* = 22, *M*= 117.27 , *adj M* = 99.50), Class 6 (*n* = 33, *M*= 65.85, *adj M* = 79.34).

During the second stage of analysis, assumptions of t-test were checked using adjusted group posttest means from stage 1. Assumptions of t-test including one dependent variable measured at the continuous level, one independent variable with two categorical and independent groups, and independence of observations were met by study design. There were 102 students in the experimental classes and 84 students in the comparison classes. An independent-samples t-test was performed to determine if there were differences in the mean number of words written between experimental and control classes. No outliers were found in the data, as assessed by inspection of a boxplot. The assumption of normality was not found to be tenable, as assessed by Shapiro-Wilk's test ($p < .05$); however, t-test is robust to violations of normality. The assumption of homogeneity of variances was found to be tenable, as assessed by Levene's test for equality of variances (*p* = .44). Students in experimental classes included more words in their essays (*M* = 99.99, *SD* = 11.50) than students in comparison classes (*M* = 81.07, *SD*

= 11.90), a statistically significant difference, *M*= 18.92, 95% CI [15.52 to 22.31], t (174.78) = 10.99 , *p* = .00. Large effects on length was observed in students' writing (*d* = 1.62).

Table 6

Means, Standard Deviations, Adjusted Means, and Effect Sizes for Writing Measures

Measure	Group	*N*	*M*	*SD*	*Adj M*	*Adj SD*	*ES (d)*
Elements of Opinion Essays							
	Experimental	102	11.34	4.64	11.43	1.70	0.86
	Comparison	84	7.13	3.28	7.02	1.09	
Length							
	Experimental	102	100.76	45.94	99.99	11.50	1.62
	Comparison	84	80.13	47.70	81.07	11.90	

Note. M = mean , *SD* = standard deviation*, Adj M* = adjusted mean*, Adj SD* = adjusted standard deviation, *ES* = effect size, *d*= Cohen's *; ES = Medium (.50), or large (.80) as suggested by Cohen (1988)*

Students with SLD. Table 7 includes means and standard deviations for students with disabilities and without disabilities on pretest and posttest writing measures. On pretest essays, students with SLD in both the experimental group (*M* = 2.00, *SD* = 2.45) and the comparison group (*M*= 3.33, *SD*= 3.50) included fewer elements of opinion essays in their writing than non-disabled students in the experimental group (*M* = 4.54, *SD* = 3.05) and the comparison group (*M* = 4.82, *SD* = 3.37).

At posttest, students with SLD in both the experimental group (*M* = 6.14, *SD* = 5.87) and the comparison group (*M* = 3.67, *SD* = 2.80) included fewer elements of

opinion essays in their writing than non-disabled students in the experimental group (*M* = 12.03, *SD* = 4.22) and comparison group (*M* = 7.52, *SD* = 3.23).

The change from pretest to posttest was greater for non-disabled students in both the experimental group (Δ = 7.49) and comparison group (Δ = 2.70). The change from pretest to posttest was larger for students with SLD in the experimental group (Δ = 4.14) than students with SLD in the comparison group (Δ = 0.34).

On pretest essays, students with SLD in the experimental group (*M* = 18.29 , *SD* = 11.20) wrote fewer words than non-disabled students. Students with SLD in the comparison group (M = 60.67, SD = 59.26) included slightly fewer words than non-disabled students in the comparison group (*M* = 61.97, *SD* = 56.10). At posttest, students with SLD in both the experimental group (*M* = 57.43, *SD* = 42.23) and the comparison group (*M*= 45.17, *SD* = 36.12) wrote fewer words than non-disabled students in the experimental group (*M* = 106.86 , *SD* = 44.49) and comparison group (*M* = 61.97, *SD* = 56.10).

The change from pretest to posttest was slightly greater for students with SLD in the experimental group (Δ = 39.14) than non-disabled students (Δ = 34.89). In the comparison group, a decrease in words written was shown by both students with SLD (change = -15.50) and non-disabled students (change = -22.91).

Table 7

Descriptive Statistics: Students with SLD and Non-disabled Students

Group	Disability Status	Pretest		Posttest		
		M	*SD*	*M*	*SD*	*Δ*
Elements of Opinion Essays						
Experimental	Non-disabled	4.54	3.05	12.03	4.22	7.49
	SLD	2.00	2.45	6.14	5.87	4.14
Comparison	Non-disabled	4.82	3.37	7.52	3.23	2.70
	SLD	3.33	3.50	3.67	2.80	.34
Length						
Experimental	Non-disabled	71.97	63.37	106.86	44.49	34.89
	SLD	18.29	11.20	57.43	42.23	39.14
Comparison	Non-disabled	61.97	56.10	84.88	48.24	-22.91
	SLD	60.67	59.26	45.17	36.12	-15.50

Note. M = mean, *SD* = standard deviation, SLD = specific learning disability

Social validity. Students (n = 96, 94%) in the experimental classes completed the Children's Intervention Rating Profile (CIRP), a 15-item Likert survey. All students in the experimental group did not complete the survey due to scheduling. Six students completed essays during the posttest session, but did not complete the social validity survey because they either came to class from a pull-out group after the posttest writing began or completed the posstest on a makeup day and the survey was not administered due to time constraints of the school schedule. The CIRP asks children to rate their agreement with statements regarding perceived acceptability and usefulness of the instruction (see Table 8). In the survey, SRSD instruction is referred to as "the writing program"; however, survey administrators explained to students the meaning of the term. According to the mean scores of survey responses, students indicated that they like writing, that writing is generally not hard for them, and they do not get frustrated with writing. Students agreed that their teachers encourage them to write. In relation to the SRSD writing instruction, students agreed that they liked the program, and that the program will help them write better opinion essays. They strongly agreed that the program will help them do better in school. Students somewhat disagreed that the program helped them work better with friends or that the program caused problems with friends.

Teacher-level Results

Teacher knowledge assessment. Two teachers completed both the pretest and posttest SRSD content knowledge assessment. One teacher did not complete the pretest prior to training, thus only the scores for her posttest are included. The pretest was

Table 8

Children's Intervention Rating Profile

Item	Mean	Range	SD
I like writing.	2.30	1 - 6	1.69
Writing is hard for me.	4.64	1 - 6	1.78
The writing program we used makes sense.	1.38	1- 6	0.97
My teacher encourages me to write.	2.01	1 - 6	1.72
I get frustrated when I have to write essays.	4.26	1 - 6	2.05
Being in the writing program caused problems with my friends.	5.49	1 - 6	1.28
There are better ways to teach me to write opinion essays.	3.83	1 - 6	2.11
This opinion writing program could help other kids too.	1.36	1 - 6	1.07
I liked the program we used.	1.80	1 - 6	1.31
Being in the program helped me to work better with my friends.	3.89	1 - 6	2.09
I think this program will help me do better in school.	1.78	1 - 6	1.34
I think being in this program helped me learn to write better opinion essays.	1.42	1 - 6	1.08

Note. 1 = strongly agree, 2 = agree, 3= somewhat agree, 4= somewhat disagree, 5= disagree, 6 = strongly disagree
* = negatively worded question

completed prior to Writing to Learn™ training and the posttest was completed approximately three months after teachers completed the online training (See Appendix C).

Teacher A scored 13 out of 40 (33%) on the knowledge pretest and 18 out of 40 (45%) on the posttest. Teacher A identified 2 out of 6 (33%) stages of SRSD correctly on pretest and 3 out of 6 (50%) stages correctly on the posttest. At posttest Teacher A correctly identified the first three stages of SRSD, but identified the final 3 stages out of order. For example, "Memorize it" was chosen as the last stage of SRSD. Teacher A identified stage one correctly and correctly identified 2 out of 4 listed tasks that should be completed in stage one (e.g., Develop background knowledge, pre-skills, vocabulary, and

collect pre-assessment). Stage two was identified correctly and 2 out of 4 listed tasks that should be completed in stage two were also correctly identified (e.g., Provide a deeper discussion of the benefits of strategy use and map models using graphic organizers). Stage three was identified correctly and 3 out of 4 listed tasks that should be completed in stage three were also correctly identified (e.g., Model planning and writing using think-alouds, exemplify and support goal setting, and portray collaborative planning and writing activities).

Teacher B scored 7 out of 40 (18%) on the knowledge pretest and 21 out of 40 (53%) on the posttest. Teacher B identified 1 out of 6 stages (17%) of SRSD correctly on the pretest and 4 out of 6 (67%) stages correctly on the postest. Teacher B identified stage one correctly and correctly identified 3 out of 4 listed tasks that should be completed in stage one (e.g., Develop background knowledge, pre-skills, vocabulary, collect pre-assessment, and provide an overview of the writing strategy). Stage four was identified correctly and 1 out of 2 listed tasks that should be completed in stage four were also correctly identified (e.g., ensure strategy is memorized). Stage five was identified correctly and 1 out of 4 listed tasks that should be completed in stage three were also correctly identified (e.g., provide feedback on writing, self-regulation, and scoring guidelines, fading support when students are ready) Provide feedback and support for self-regulation (self-talk, goal setting, checking off steps in strategies, etc.). Stage six was identified correctly and 1 out of 2 listed tasks that should be completed in stage six were also correctly identified (e.g., ensure strategy is memorized). Stage five was identified correctly and 2 out of 3 listed tasks that should be completed in stage six were also

correctly identified (e.g., independent use of strategies and self-regulation, fade overt self-instruction to covert).

Teacher C scored 25 out of 40 (63%) on the posttest and correctly identified 6 out of 6 (100%) stages of SRSD correctly. Teacher C identified stage one correctly and correctly identified 2 out of 4 listed tasks that should be completed in stage one (e.g., develop background knowledge, pre-skills, vocabulary, collect pre-assessment). Stage two was identified correctly and 2 out of 4 listed tasks that should be completed in stage two were also correctly identified (e.g., provide a deeper discussion of the benefits of strategy use, and develop goals and self-talk statement). Stage three was identified correctly and 2 out of 4 listed tasks that should be completed in stage three were also correctly identified (e.g., model planning and writing using think-alouds, and model and practice graphing routines). Stage four was identified correctly and 2 out of 2 listed tasks that should be completed in stage four were also correctly identified (e.g., ensure strategy is memorized, and internalize personalized self-statements). Stage five was identified correctly and 3 out of 4 listed tasks that should be completed in stage five were also correctly identified (e.g., map models using graphic organizers, provide feedback on writing, self-regulation, and scoring guidelines, fading support when students are ready, and provide feedback and support for self-regulation (self-talk, goal setting, checking off steps in strategies). Stage six was identified correctly and 2 out of 3 listed tasks that should be completed in stage six were also correctly identified (e.g., independent use of strategies and self-regulation, fade overt self-instruction to covert).

Survey of classroom writing practices. Teachers completed the Survey of

Classroom Writing Practices (Cutler & Graham, 2008) to describe typical classroom writing practices. The survey was completed prior to Writing to Learn™ training and opinion writing instruction. Teacher's completed the survey online through Qualtrics (see Appendix B). The survey consists of two sections: (a) 41 Likert-scale questions, and (b) description of writing practices related to strategy instruction for writing.

Based on the mean results of the survey data, the six participating teachers spent approximately 30 minutes teaching writing on four days a week. Their writing program involved both teaching the writing process, peer and teacher conferencing, and skills instruction. Components of the writing process, including planning, revising, and publishing, were taught monthly. Teachers conferenced with students about writing several times a month, while students engaged in conferencing with their peers monthly or several times a year. In relation to skills instruction, sentence construction was taught several times a year. Text organization was taught several times a month. Handwriting skills were never addressed or addressed several times a year, but not monthly. Specific spelling skills were taught several times a year. Grammar, punctuation, and capitalization skills were taught weekly.

Teachers reported on questions about strategy instruction in relation to opinion essays including planning strategies, identifying parts of an opinion essay, goal-setting, self-assessment, and using self-statements. While one teacher reported teaching a strategy for planning an opinion essay and teaching the parts of an opinion essay, no teachers reported teaching goal-setting or self-assessment. Four teachers reported teaching students to use self-statements.

Teacher perceptions of online professional development. A secondary research question focused on teachers' perceptions of SRSD Writing to Learn™ for professional development. Three intervention teachers completed a Likert scale survey that included items to address teacher perceptions of content relevance, online features, online participation, and transformational learning for instructional practice. The scale for each item ranged from 1 – 6 (e.g., *Note.* 1 = strongly agree, 2 = agree, 3= somewhat agree, 4= somewhat disagree, 5= disagree, 6 = strongly disagree). Although means were calculated for each item, the range of responses among three teachers typically show that the three teachers often responded to each item with different levels of agreement.

Online participation. Teachers chose where they completed the modules. Two teachers completed the modules at home, and one teacher completed the modules at school. Teachers completed the modules separately and independently.

Content relevance. The content relevance category included three items. According to the mean scores teachers indicated that they agreed or somewhat agreed that the Writing to Learn™ training provided information that they could use in their classroom, information they will use in the future, and theory that applies to their work. See Table 9 for results of specific items. The last item in Table 9 is worded negatively, such that a higher score indicates a positive answer. Although a mean score of 4.67 on the negatively worded question indicates disagreement with the item, the teachers are actually reporting that they are aware of how the theory provided in the modules applies to their work.

Online features and delivery quality. The online features and delivery quality

category included seven items. According to mean scores teachers indicated that the online learning was a better fit for their schedule, offered advantages over face-to-face learning, and had a good balance of presentation types. Teachers somewhat disagreed that

Table 9

Content Relevance

Item	N	Mean	Range	SD
The Writing to Learn™ modules describe activities that I can readily implement in my classroom.	3	2.67	1 - 4	1.25
The Writing to Learn™ modules provided me with information that I will use in the future.	3	2	1 - 4	0.82
*The Writing to Learn™ modules provided good theory, but I am not sure how they apply to my work.	3	4.67	3 - 6	1.25

Note. 1 = strongly agree, 2 = agree, 3= somewhat agree, 4= somewhat disagree, 5= disagree, 6 = strongly disagree
* = negatively worded item

Table 10

Online Features and Delivery Quality

Item	N	Mean	Range	SD
The online learning fits my schedule better than meeting face to face.	3	1.67	1 - 2	0.47
The online format offers content delivery advantages over face-to-face delivery.	3	1.67	1 - 2	0.47
The online part of the training was more work than I expected.	3	3	1 - 5	1.63
It was difficult to stay motivated as I worked through the modules.	3	4	3 - 5	0.82
The modules have a good balance in their text, video, and interactive tasks.	3	2.33	1 - 4	1.25
Navigating the modules was a clear and simple process.	3	4	2 - 5	1.41
As I worked through the online modules, I felt as though I was on information overload.	3	2.67	1 - 5	1.70

Note. 1 = strongly agree, 2 = agree, 3= somewhat agree, 4= somewhat disagree, 5= disagree, 6 = strongly disagree

it was difficult to stay motivated to complete the modules. Teachers somewhat agreed that the modules caused them to feel as though they were receiving too much information, and that navigation through the modules was clear and simple. (i.e., the modules were not clear and simple to navigate). See Table 10 for results of specific items.

Transformational learning and instructional practice. The transformational learning and instructional practice included four items. According to the mean scores teachers somewhat agreed that they had set goals for themselves regarding SRSD instruction, could easily adapt the content to their classrooms, learned practical information and would recommend the training to a friend. See table 11 for results of specific items.

Table 11

Transformational Learning for Instructional Practice

Item	N	Mean	Range	SD
I have set goals for myself regarding the implementation of SRSD instruction.	3	3.33	2 - 5	1.25
The content in the modules is easily adaptable to my classroom instruction.	3	2.33	1 - 3	0.94
I learned a great deal of practical information for my teaching as a result of Writing to Learn™ training.	3	2.33	1 - 3	0.94
I would recommend the Writing to Learn™ training to my colleagues.	3	2.33	1 - 3	0.94

Note. 1 = strongly agree, 2 = agree, 3= somewhat agree, 4= somewhat disagree, 5= disagree, 6 = strongly disagree

Conclusion

The results of this study add to the evidence-base for SRSD instruction for opinion writing with students who are typically developing, struggling learners, and

students with SLD. Although the small sample of teachers (n = 3) who contributed data about knowledge of SRSD and perceptions of SRSD Writing to Learn™ training is not large enough to make statistical conclusions, results of teacher assessments and surveys add valuable information to the study. First, it is important to determine how PD impacts teachers' content knowledge to provide support for teacher instructional change. For example, if only student achievement were measured, and positive student effects were not achieved for a specific teacher, it would be difficult to determine whether teacher content knowledge or teacher practice may have contributed to the ineffectiveness of the instruction. Additionally, teacher perceptions of the SRSD Writing to Learn training reveal whether teachers felt the training was appropriate in relation to the delivery, format, and time required to complete. Such information will inform future research regarding the use of SRSD Writing to Learn™ training. The results will assist both school leaders and individual teachers in making decisions about participation in online training to support the use of SRSD as an EBP.

Chapter 5

Discussion

The ability to write is essential for post-secondary environments, yet many students leave school without the writing skills required for post-secondary settings. While many students in general education settings struggle with writing, students with specific learning disabilities (SLD) who spend the majority of their day in the general education setting experience even greater challenges and require more intensive intervention for improvement in writing skills. Self-regulated strategy development (SRSD) is an instructional framework that addresses writing skill deficits and challenges for all students and is considered an evidence-based practice (EBP). However, SRSD is not widely implemented in schools. One way to increase implementation of SRSD to impact writing outcomes of students is to provide effective and sustained professional development (PD) so teachers are able to provide effective instruction using the SRSD framework. While in-person PBPD is effective in increasing teachers' implementation of effective interventions (Festas et al., 2015; Harris et al., 2012a; McKeown et al., 2016), in-person PD can pose several challenges for school and teachers (e.g. expense, time, physical location). Online professional development (OPD) offers a potential solution to some of the challenges of in-person PD.

The present study adds to the literature by examining the effects of SRSD opinion writing instruction provided by teachers who completed SRSD Writing to Learn™ online training on upper elementary students' opinion writing performance. Although SRSD Writing to Learn™ online training has been used nationwide, no empirical study has

investigated the impact on student writing achievement following teacher training. A secondary purpose of the present study was to determine teachers' perceptions of SRSD Writing to Learn™ OPD and the impact of the OPD on their knowledge of SRSD. This chapter is divided into four sections (1) an interpretation of the findings, (2) a discussion of study limitations, (3) directions for future research, and (4) implications for practice.

Interpretation of Findings

Student-level

Question 1. What is the effect of SRSD writing instruction provided by upper elementary teachers who have completed SRSD Writing to Learn™ online training compared to writing instruction by upper elementary teachers in a business-as-usual comparison group on students' writing achievement on opinion writing samples as measured by: (a) the number of genre elements included in students' opinion writing samples and (b) the length of students' opinion writing samples?

Student pretest and posttest opinion writing samples were evaluated to determine the length and number of opinion essay elements included. Statistical analysis revealed that experimental classes included statistically significantly more elements of opinion essays in their posttest and wrote statistically significantly longer essays. The findings from the current study indicated that students benefitted from SRSD instruction after their teachers completed OPD for SRSD, which provides additional support for SRSD to teach opinion writing instruction to upper elementary students, and preliminary support for OPD as an effective type of PD for SRSD.

The current study adds to the literature for SRSD instruction in opinion writing at the upper elementary level, which according to a review of the literature, is a genre and grade level that is limited in the research. Opinion writing is emphasized in the CCSS, beginning at the kindergarten level; however, some skills required for opinion writing (e.g., analyzing conflicting viewpoints) are not developed until later grades. Elementary students need to have a firm foundation in opinion writing to be proficient in argumentative writing that takes place at the secondary level. Results from this study suggests that SRSD is effective for opinion writing instruction at the elementary level, which provides a foundation for argumentative writing that takes place at the secondary level. Additionally, this study includes fourth grade students in the general education setting, which is a population that is underrepresented in the literature. For research to be generalized, it is important that studies be completed with various populations of students. The inclusion of fourth grade students in this study provides support for generalization of findings to the fourth grade level.

Findings related to writing measures (e.g., elements of opinion essays and length) were consistent with SRSD literature. Students' increases in elements of opinion essays included in posttest essays are consistent with PBPD for SRSD research that resulted in positive impacts on student writing outcomes with large effect sizes. In the study effect sizes are interpreted following Cohen (1988) guidelines (e.g., 0.20 = small effect, 0.50 = medium effect, ≥ 0.80 = large effect). Findings in the current study resulted in large effects for both length (d = 0.62) and elements of opinion essays (d = 1.62). Effect sizes describe the size of the difference in outcomes between each group. Effect sizes are also

useful to illustrate the practical significance of an intervention. The large effects found in the study indicate that the difference in scores between comparison and experimental groups was large and demonstrates that results were significant and practically meaningful. Scoring for opinion essays included points for topic sentence, reasons, explanations, and endings. As a result of SRSD instruction following teachers' participation in SRSD Writing to Learn™ OPD, students in the experimental group were able to use an opinion writing strategy and self-regulation strategies to successfully plan elements of opinion essays in their response and then translate their plan to writing. The positive significant differences in the writing performance of students in the experimental group indicate that strategy instruction for writing, such as the OREO strategy taught in comparison classes, is not as beneficial as strategy instruction and self-regulation strategies.

Findings related to the length of writing in SRSD literature are mixed. While some studies have found increases in length of essays and stories following SRSD instruction (Harris et al., 2006), other studies have found no significant increases in length of essays (Harris et al., 2012b). In the current study, students in experimental classes wrote longer essays at posttest than students in control classrooms. Increasing the length of essay was not a goal of instruction; however, experimental teachers did emphasize to students that the more examples and explanations that they wrote, the better their essays would be. Examination of scored pretest rubrics indicate that at pretest many students did not include elements of opinion essays and did not consistently use transition

words. Therefore inclusion of more essay elements and transition words likely impacted the length of students' essays.

Findings related to both elements of opinion essays and length of essays demonstrate that following SRSD Writing to Learn™ OPD, with little support from researchers, teachers were able to positively impact students' writing. This study provides preliminary support for OPD for SRSD. Because writing is a skill that is foundational to most other subject areas and a skill with which many students struggle, teachers need access to effective PD that allows them to increase their knowledge and skills related to teaching writing. For teachers to impact the writing of their students, especially those who struggle, teachers require knowledge of EBPs, which can be gained through effective PD. Professional development research should establish a link between PD and student achievement and be of rigorous design (Yoon, Duncan, Lee, Scarloss, & Shapley, 2007). Because teachers were able to implement SRSD instruction with a high level of fidelity and positively impact on students' writing following SRSD Writing to Learn™ OPD, results from this study suggest a link between SRSD Writing to Learn™ OPD and student achievement. The use of SRSD Writing to Learn™ training has the potential to improve the translation of research to practice by providing an alternative to in-person PD that is both effective and feasible. Furthermore, because many students with and without disabilities struggle with writing during and after school, it is promising that SRSD Writing to Learn™ OPD has potential to bring SRSD to an audience of teachers who may not have access to in-person PD.

Question 2. What are the differential effects of SRSD instruction provided upper elementary teachers who have completed SRSD Writing to Learn™ online training on writing performance (as measured by genre elements included and length opinion writing samples) of students with learning disabilities compared to their non-disabled peers?

On the posttest writing elements of opinion writing measure, students without SLD in both the experimental and comparison groups outperformed students with SLD; however, students with SLD in the experimental group outperformed students with SLD in the comparison group. Due to the small number of students with SLD, statistical analysis could not be completed to determine the effectiveness of instruction; however, examination of means and standard deviations suggests that SRSD instruction was more effective for students with SLD than comparison group instruction. The indication that students with SLD in experimental classes outperformed students with SLD in control classes is consistent with previous SRSD research, which has found large effect sizes for students with SLD (Graham et al., 2013).

One possible reason that students with SLD in the experimental group outperformed students with SLD in the comparison class is that SRSD contains direct instruction of self-regulation strategies and academic (e.g., writing) strategy instruction that address difficulties that students with SLD face when writing. For example, students with SLD often struggle with planning. Although both the experimental and comparison teachers taught a strategy for opinion writing, students with SLD in the experimental classes appear to have used the strategy to plan, whereas students in the comparison classes did not evidence planning using a strategy. Informal examination of students'

with SLD pretest and posttest writing samples show that one out of seven students with SLD in the experimental classes documented planning on the writing pretest, while three students documented planning using the POW+TREE strategy on the posttest. In the comparison classes, no students with SLD documented planning on the neither the pretest nor posttest.

Another area that students with SLD struggle with is motivation for writing and goal setting. Self-regulated strategy development includes direct instruction in goal setting, self-monitoring, and self-reinforcement, which all may positively impact a students motivation for writing. Students' motivation for writing was not measured in the current study; however, if experimental students' motivation for writing were increased more than students in the comparison group, their persistence to complete the steps for inclusion of genre elements in their essays may have been stronger.

Interestingly, students with and without SLD in the experimental group experienced similar increases in the lengths of their essays while students with and without SLD in the comparison group experienced similar decreases in the length of their essays. Research related to the length of essays has documented both increases and decreases in length after instruction. For example, McKeown et al. (2016) found significant increases in length for students who were struggling writers while average writers' essays decreased in length. Harris et al. (2012b) found decreases in length for both stories and opinion essays after SRSD instruction, but (Graham et al., 2005) found that students increased lengths of stories and opinion essays. One possible reason the length increased in the experimental group is the focus of the strategy instruction of

having three or more reasons, transition words, and an ending. If students included these elements that were not included in the pretest essay, then more words would be written. Based on observation, the strategy that comparison group teachers taught (OREO) did not emphasize three or more reasons and examples to the extent that experimental teachers did. Another explanation for decreases in length of essays for students with SLD in the comparison group could be that students excluded irrelevant information once they learned a strategy for opinion writing. Although quality and organization of writing was not formally assessed, informal observations of students' writing at pretest provided evidence that students' writing was more disorganized and included more extraneous information compared to writing at posttest. For example, many pretests essays included information that either did not support the stated opinion or was off-topic. For both the experimental and comparison groups, students' writing at posttest was generally more organized and concise. Although students in the experimental group also wrote more organized essays after opinion writing instruction, it is possible that the length of essays did not decrease due to the increase in elements of opinion essays included in their posttest.

Generally, students with SLD struggle with many aspects of writing such as writing output, applying genre elements, organization, and self-regulation. Although SRSD addresses these skills, students with SLD often require more intensive instruction to impact their writing. Current findings provide tentative support that SRSD is an effective framework for improving writing performance for students with SLD who receive instruction in the general education setting; however because their performance

lagged behind nondisabled peers, data suggest that students with SLD require more intensive writing intervention to make gains commensurate to their peers. For example, students with SLD may require a longer period of instruction, more frequent instruction, smaller group instruction, or one-on-one instruction to maximize writing outcomes.

Question 3. What are students' perceptions of the acceptability of SRSD instruction?

An analysis of CIRP surveys indicated that students liked the SRSD instruction and agreed that the instruction will help them do better in school and write better opinion essays. The lowest scores on the survey indicated that students did not think writing was hard for them and the SRSD instruction did not cause problems with friends. The results are consistent with findings in other SRSD research for opinion writing (e.g., Harris et al., 2012a) in which students reported general acceptability of SRSD instruction. Social validity at the student level is especially important for SRSD because a large component of SRSD is the students' use of self-regulation strategies. If students agree that the strategies are useful and helpful, they may be more likely to use the strategies.

Teacher-level

Question 1. Does SRSD Writing to Learn™ online professional development impact experimental teachers' knowledge of SRSD?

Based upon results from the teacher content knowledge assessment, after OPD and SRSD implementation, teachers were able to identify some of the stages of SRSD and the corresponding instructional objectives at each stage. The Yoon et al. (2007) model that explains the process by which PD affects student achievement outlines the

following expectations: (a) effective PD adds to teacher knowledge, (b) added teacher knowledge results in improvement in classroom teaching, and (c) the enhancements to teaching increase student achievement. When viewing the findings in reference to the Yoon et al. (2007) model, added content knowledge should influence teaching and student achievement. Teachers in the current study were able to implement SRSD and increase student achievement but did not demonstrate complete knowledge of SRSD stages and corresponding instructional objectives. This finding suggests that teachers relied on SRSD training and classroom materials to implement instruction with fidelity, but did not memorize the stages or instructional components of SRSD. While results of the content knowledge assessment should not be generalized, they provide information that may be used in the design of future content knowledge assessments and research into the connection between teacher content knowledge, instruction, and student achievement. Although teachers were able to identify some of the stages of SRSD and instructional components at each stage, they demonstrated though conversation, instruction, and student achievement that they may have been more knowledgeable of SRSD than the assessment results indicated. Future research should address content assessments that provide more effective measurement of content knowledge. For example, interviews might be useful in determining teachers' deeper understanding of the SRSD framework. In addition, research to document technical adequacy of content knowledge assessments within the SRSD framework should be conducted.

Many aspects of the SRSD content knowledge assessment could have been problematic to the measurement of teacher content knowledge. Although teachers did

show a positive change in scores from pretest to posttest, teachers' posttest scores did not indicate substantial teacher growth in content knowledge. The highest score posttest score was 63%, and only one teacher identified all stages of SRSD correctly at posttest. This finding could be due to the design of the assessment. Teachers were asked to choose *all* activities that should take place at each stage of SRSD, but often they choose only one or two activities at each stage. It could be argued that growth in content knowledge may have been diluted because of the delayed posttest (e.g., four months after training); however, because teachers completed OPD and implemented SRSD, it seems that they should have performed high scores for content knowledge on a delayed posttest. A posttest given closer to completion of training may have resulted in better performance on teacher knowledge assessment, but even that could be problematic if teachers showed less content knowledge on the delayed assessment. Although the assessment may not have allowed teachers' content knowledge to be fully represented, results of student writing assessments support that while teachers demonstrated partial knowledge of SRSD stages and instructional components on a delayed content knowledge assessment, with the use of tools and materials from SRSD Writing to Learn™, they implemented SRSD with a moderate to high level of fidelity and impacted student writing achievement. If teachers had struggled to implement SRSD or if students' writing achievement had not been impacted, content knowledge assessment results would have been more meaningul to help make determinations about potential causes of lack of implementation or impact on student achievement. For example, if a teacher scored low on the knowledge assessment and struggled with implementation, it could be concluded that lack of content

knowledge could be a potential cause of difficulty with implementation.

Another interesting finding related to content knowledge is that one teacher had a greater change in content knowledge from pretest to posttest and was able to identify all stages of SRSD correctly compared to another teacher; however, fidelity of instruction for the teacher that performed better on the content knowledge assessment was lower than the teacher who performed lower on the content knowledge assessment. It seems that teachers with greater content knowledge should be able to implement instruction with greater fidelity. Other factors such as experience, classroom management skills, organization, and teaching skills may impact a teacher's ability to implement SRSD effectively.

Question 2. What are experimental teachers' perceptions of SRSD Writing to Learn™ online professional development?

Teachers generally responded positively to items related to content relevance, online features and delivery quality, and transformational instructional practices. Content has been regarded as a critical aspect of effective PD (Desimone, 2009). Teachers reported that the content of the Writing to Learn™ training was readily useful in the classroom, provided information that teachers will use in the future, and provided theory that is applicable to teachers' work. If teachers view PD content as meaningful and applicable, they will be more likely to apply what they learn to their teaching. Furthermore, although the knowledge assessment did not support large gains in teacher content knowledge, results of the teacher perceptions survey indicated that teachers reflected on how the content related to their instruction and set goals for themselves

regarding the implementation of SRSD.

Although teachers in the current study were required to complete the OPD in one day, they reported that the online training offered advantages over in-person training and that it better fit their schedule. Teachers reported that navigating the modules was somewhat unclear and that they somewhat felt like they were on information overload. If teachers had more time to complete the modules, such as dividing the training over two half-days or several afterschool sessions, it is possible that the information would be less overwhelming; however, the school administrator wanted teachers to complete the majority of the training on a day when a substitute teacher was provided for each experimental teacher. Teacher perceptions of the online training support that OPD for SRSD could be a valuable alternative to in-person PD. When considering PD for SRSD, educators should consider the advantages and disadvantages of each type and choose PD that best fits their needs. Advantages to OPD include flexibility of time and setting, lack of need for a substitute, collaboration across districts and collaboration among specialized teachers. However, disadvantages to OPD include the possibility of learners feeling isolated and students being more susceptible to misunderstanding information. Some advantages of in-person PD include opportunities to practice instruction with peers, support from an expert, and opportunities to practice instruction with peers. However, limitations of in-person PD include costs, time, and space.

Fidelity of instruction. Teachers implemented instruction with a moderate to high level of fidelity. Two of the three teachers implemented instruction with a moderate and acceptable level (e.g. at least 85%) of fidelity. The moderate fidelity score is partially

due to teachers omitting the steps of administering a quiz at the beginning of lessons or announcing a quiz at the end. If these steps had not been counted, fidelity likely would have increased. The fidelity scores are consistent with PBPD research where teachers implemented SRSD with 78-99% fidelity as measured by researcher observation.

Although teachers were able to implement lessons with fidelity according to the implementation checklist, other aspects of teaching such as quality of instruction, differentiation, and formative assessment to inform instruction were not measured. Anecdotal notes and conversations with teachers suggest differences among teaching skills of teacher likely impacted instruction. For example, one teacher had difficulty differentiating lessons to meet the needs of struggling writers and sought researcher advice on how to differentiate. Another teacher mentioned that the fidelity checklist made her nervous and that she was afraid of missing steps. McKeown et al. (2017) found similar teacher responses in interviews where teachers reported being that monitored for fidelity may have impeded some authentic differentiation of instruction for fear that a step on the fidelity checklist might have been missed. One teacher in the current study also required researcher feedback to fully implement self-talk, which is also consistent with teacher feedback in McKeown et al. (2017). Rather than modeling self-talk for students, the teacher told students what they should say to themselves. To assist the teacher, the primary research demonstrated part of the self-talk in the lesson and watched as the teacher practiced the next segment. The researcher also directed the teacher to the module in SRSD Writing to Learn™ training that addressed self-talk and modeling. In summary, although teachers in the current study were able to implement steps required in

the fidelity checklist, further observation and analysis would provide richer information about the impact of OPD for SRSD on other skills and instructional strategies related to quality instruction and SRSD.

Limitations

Although steps were taken in the research design to minimize threats to validity, some limitations remain. First, a limited number of teachers provided teacher-level information to including demographic information, content knowledge assessments, and teacher perceptions of online training survey. While the impact of teachers' instruction in SRSD yielded positive effects on student writing achievement, a larger number of teacher participants would increase the generalizability of findings. Generalizability is also impacted due to the study being conducted in one elementary school. The inclusion of several research sites would increase generalizability.

Several steps were taken in the original study and design to guard against threats to statistical conclusion validity. One strategy to increase power is to include a covariate that is correlated with the outcome and use the covariate adjustment in statistical analysis (Shadish et al., 2002). In the study, a writing pretest at the individual and group level was originally planned to be a covariate; however, due to violation of assumptions at the group level of analysis, a covariate could not be used in the group level analysis. This has the potential to increase the probability of a Type I or Type II error.

The design of the teacher content knowledge test may have contributed to threats to construct validity. Because SRSD content knowledge assessments that have documented technical adequacy were not available from prior research, the SRSD content

knowledge assessment was researcher designed. The assessment was based on knowledge of stages of SRSD and questions included at the end of Writing to Learn™ modules. The assessment was not evaluated for technical adequacy; thus, it is difficult to determine whether the assessment was valid or reliable. Because teachers were able to implement SRSD with a high level of fidelity and were able to discuss SRSD with the primary researcher, it is possible that the content knowledge assessment did not measure the construct of content knowledge of SRSD appropriately. Furthermore, other types of teaching knowledge, such as general knowledge of writing instruction, likely impacted instruction. To more fully measure teacher content knowledge and prevent measurement of constructs in only one way (e.g., monomethod bias), a writing content knowledge assessment could also be given.

Implications for Practice

This study demonstrates that teaching upper elementary students opinion writing using the SRSD framework for instruction is effective in increasing students' achievement in opinion writing. While instruction for SRSD is effective for whole class, Tier 1 instruction, struggling writers will likely require more intensive instruction than what is provided to the whole class. When considering SRSD instruction in the general education setting, factors to address all students' needs should be considered. For example, teachers should be supported in differentiating instruction within the general education setting and supplementing and intensifying instruction in intervention or special education settings.

After teachers completed SRSD Writing to Learn™ OPD, their instruction

positively impacted students writing achievement. This provides preliminary evidence that SRSD Writing to Learn™ OPD is effective for upper elementary opinion writing. Experimental teachers were able to implement SRSD with fidelity and generally had favorable perceptions of the OPD. These findings support that OPD may be a possible alternative to in-person PD.

Although there are benefits to OPD and experimental teachers found the Writing to Learn™ training to be acceptable, educators should consider the benefits and challenges of both in-person PD and OPD when making PD decisions. For example, OPD offers benefits of flexibility and cost effectiveness, but may need to be supplemented with opportunities for collaboration and discussion with a person knowledgeable about SRSD.

In the current study teachers implemented SRSD with limited support from an expert; however, in practice support from someone with in-depth knowledge of SRSD could foster greater impacts on student writing achievement, as well as sustained implementation. In-person PD offers opportunities for collaboration and practice, but often has disadvantages of higher costs, time constraints, and space for training.

Another aspect of PD and implementation of SRSD that educators must consider is effectiveness and sustainability. Effective PD is: (a) content focused; (b) incorporates active learning; (c) supports collaboration; (d) uses models of effective practice; (e) provides coaching and expert support; (f) offers feedback and reflection; and (g) is of sustained duration (Darling-Hammond et al., 2017). While SRSD Writing to Learn OPD provides content and models of effective practices educational leaders must consider

strategies to incorporate the remaining aspects of effective PD. In the current study researchers were available to offer feedback, coaching, and active collaboration (e.g., meeting after OPD); however, to sustain implementation of SRSD beyond this study, school leaders must determine strategies to support teachers in continuation of SRSD implementation and ways to support other teachers in learning SRSD.

Incorporating components of effective PD to SRSD Writing to Learn OPD can be accomplished in a variety of ways. For example, to incorporate active collaboration, coaching, feedback, and sustained duration, educational leaders can create professional learning communities or communities of practice. To enhance duration, community activities should take place beyond the initial online training (i.e., throughout the school year). It is essential that educational leaders or teachers who are knowledgeable about SRSD (i.e., expert teacher) be available to participate in either type of community to provide coaching and feedback. Educational leaders also have an important role in creating time for collaboration among teachers either in person or online. While there are multiple ways that educational leaders can combine OPD for SRSD and support for effectiveness and sustainability within the school, leaders must consider their resources and needs to determine how to organize the PD experience for effectiveness and sustainability.

Future Research

Although this study provides initial evidence that OPD for SRSD may improve students writing and provide an effective alternative to in-person PD, future research can build on this study in many ways. First, a limitation of the current study was the small

teacher sample size. To increase support and generalizability for Writing to Learn™ OPD for opinion writing, larger scale studies could be completed with multiple schools. This would allow a larger number of teachers and students to be included.

Writing to Learn™ OPD is available for opinion, informative, and narrative writing in kindergarten through sixth grade level. Future research should examine the use of Writing to Learn™ OPD for other genres of writing and other grade levels. Although SRSD instruction is equally effective for opinion and narrative writing and all grade levels, it is unknown whether OPD is differentially effective for different genres or grade levels.

Furthermore, generalization of instruction in SRSD from one genre to another should be investigated. Because SRSD is a framework for instruction, teachers should be able to teach a range of strategies across multiple genres within the framework. Future research should investigate whether teachers are able to generalize SRSD instruction to a variety of genres and the level of support that they may need to generalize instruction.

Another area of future investigation is examination of the effectiveness of OPD for SRSD instruction to teach a specific writing strategy compared to teachers trained to use direct teaching of the same strategy. In the current study, experimental teachers taught a strategy for planning and opinion writing (e.g., POW + TREE), while comparison teachers taught students to use a different strategy for opinion writing (e.g., OREO). Previous research has investigated the components of SRSD, including strategy instruction only, and found SRSD to be more effective than strategy instruction alone (Sawyer, Graham, & Harris, 1992); however those studies did not involve OPD.

The current study examined teacher fidelity of instruction related to items on the fidelity checklist; however, other factors that may affect effectiveness of SRSD instruction, such as quality of instruction, differentiation for struggling students, or classroom management were not examined. Future research should examine OPD for SRSD in relation to not only fidelity of instruction, but also preskills that teachers may need to implement SRSD effectively.

A majority of students with SLD are provided instruction in the general education classroom. Although much support for the effectiveness of SRSD instruction for students with SLD exists, future research into OPD for SRSD should focus on how to support teachers to meet the needs of students with SLD. For example, research should examine how to use OPD for both general education and special education teachers and how both teachers could implement SRSD in an inclusive setting. Although teachers may be able to implement SRSD with fidelity after completion of SRSD Writing to Learn™ OPD, they may require support beyond the OPD to effectively differentiate instruction.

One type of support that could be investigated is coaching after OPD is completed. Another type of support that would be less intrusive than in-person coaching is virtual coaching that involves an expert watching a realtime video of instruction and then providing coaching feedback.

Finally, future research should examine the relationship of teacher content knowledge of SRSD, content knowledge of writing instruction, and the effects of OPD for SRSD on teacher instruction and student achievement. Findings of this study did not support a connection between the level of SRSD content knowledge and teacher

instruction; however it was difficult to determine the level of teachers' content knowledge due to limitations of the assessment. Future research should investigate technical adequacy of SRSD content knowledge assessments. SRSD Writing to Learn™ is used nationwide, thus sample assessments could be used with participants of the training, and reliability and validity of the assessment could be examined with a large sample. In addition, teachers' knowledge of writing may impact their SRSD writing instruction. Future research should examine the relationship between teachers' writing content knowledge and ability to implement SRSD instruction after OPD.

Conclusion

The present results demonstrate that the writing performance of third, fourth, and fifth grade students can be improved when provided with opinion writing instruction using the SRSD framework. While findings are preliminary, they support previous research of SRSD for opinion writing. Furthermore, results support that OPD for SRSD is a promising alternative to in person PD. Future research is needed to determine whether OPD is effective for different genres or grade levels. Additionally, future research should examine how to support teachers in implementation of SRSD, as well as the relationship between teachers' content knowledge, instruction, and student achievemen

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Appendices

APPENDIX A

Teacher Demographic Survey

Name: _____

Age: ☐ 18–25 ☐ 25–30 ☐ 31–40 ☐ 41–50 ☐ 51+

Gender: ☐ M ☐ F

Highest Degree:

☐ Bachelor's Degree

☐ Master's Degree

☐ Master's Degree + 30 hours

☐ Doctoral Degree

What degrees have you completed?

☐ Elementary Education

☐ Secondary Education

☐ Special Education

☐ Other: _____

Appendix A (Continued)

How many years have you been teaching at your current grade level?

☐ 0–2

☐ 3–5

☐ 6–8

☐ 9–11

☐ >11

How many years have you been teaching writing in elementary school?

☐ 0–2

☐ 3–5

☐ 6–8

☐ 9–11

☐ >11

How many years at your current teaching position?

☐ 0–2

☐ 3–5

☐ 6–8

☐ 9–11

☐ >11

Appendix A (Continued)

How many total students do you have in each class you teach?

☐ <10

☐ 11–15

☐ 16–20

☐ 21–25

☐ >25

How many students with disabilities do you teach (per class)?

☐ 1–3

☐ 4–6

☐ >6

How many students do you teach who are going through an intervention process (i.e., supplementary support) for reading or writing (per class)?

☐ 1–3

☐ –6

☐ >6

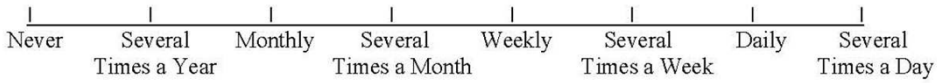
APPENDIX B

Teacher Survey of Classroom Writing Practices

Please complete the following survey about your classroom writing practices. It should take you about 15 minutes to complete.

Section 1

1. Circle how often **you conference** with students about their writing.



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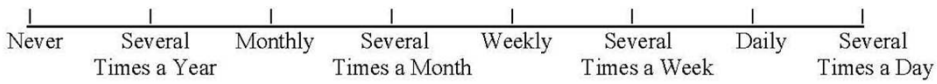
2. Circle how often **students conference with their peers** about their writing.



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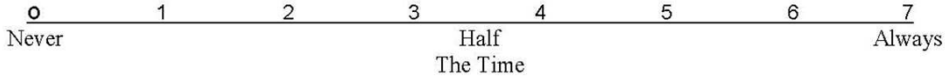
3. Circle how often **students select their own writing topics**.



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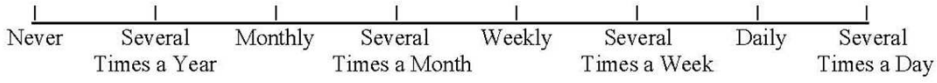
4. Circle how often your students engage in **"planning"** before writing.



Appendix B (Continued)

5. Circle how often your students **"revise"** their writing products.

Never	Several Times a Year	Monthly	Several Times a Month	Weekly	Several Times a Week	Daily	Several Times a Day

---

6. Circle how often **students share their writing** with their **peers**.

Never	Several Times a Year	Monthly	Several Times a Month	Weekly	Several Times a Week	Daily	Several Times a Day

---

7. Circle how often your students **"publish"** their writing. (Publish means to print or write it so that it can be shared with others.)

Never	Several Times a Year	Monthly	Several Times a Month	Weekly	Several Times a Week	Daily	Several Times a Day

---

8. Circle how often your **students help their classmates** with their writing.

Never	Several Times a Year	Monthly	Several Times a Month	Weekly	Several Times a Week	Daily	Several Times a Day

---

9. Circle how often students are allowed to **complete writing assignments at their own pace**.

0	1	2	3	4	5	6	7
Never			Half The Time				Always

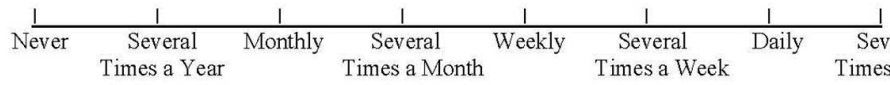
---

10. Circle how often you encourage students to use **"invented spellings"** at any point during the writing process.

0	1	2	3	4	5	6	7
Never			Half The Time				Always

Appendix B (Continued)

11. Circle how often **you read your own writing** to your students.



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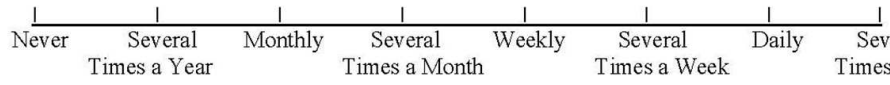
12. Circle how often you teach **sentence construction skills**.



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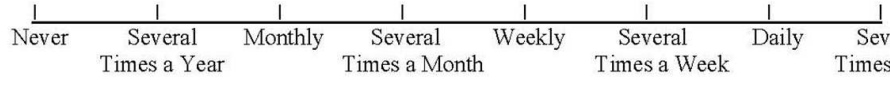
13. Circle how often you teach students about ways **of organizing text** or how texts are organized.



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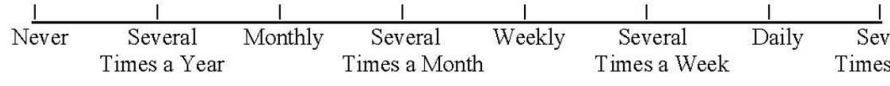
14. Circle how often you teach students **strategies for planning**.



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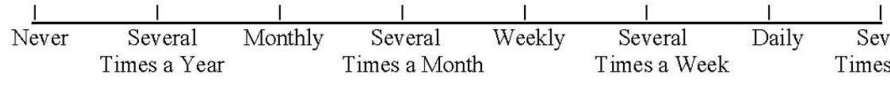
15. Circle how often you teach students **strategies for revising**.



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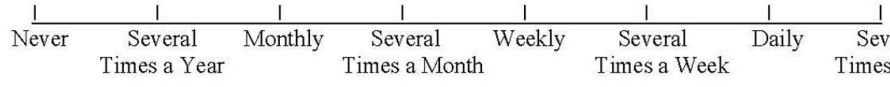
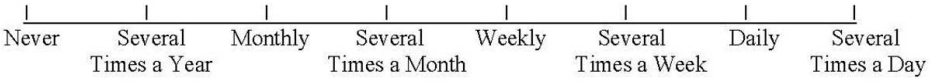
16. Circle how often you teach students **handwriting skills**.



Appendix B (Continued)

17. Circle how often you teach **spelling skills**.



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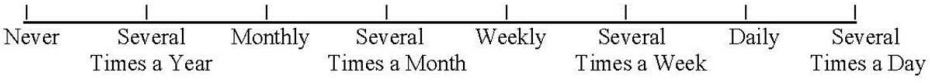
18. Circle how often you teach **grammar skills**.



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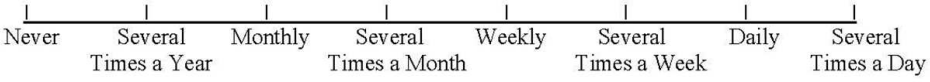
19. Circle how often you teach **punctuation skills.**



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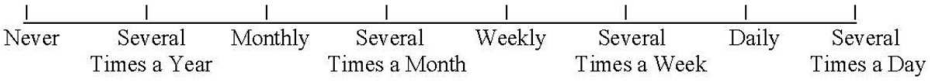
20. Circle how often you teach **capitalization skills**.



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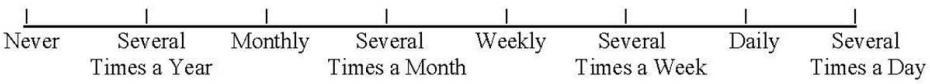
21. Circle how often you **provide mini-lessons** on writing skills or processes students need to know at this moment---skills, vocabulary, concepts, strategies, or other things.



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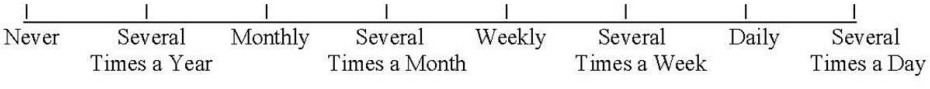
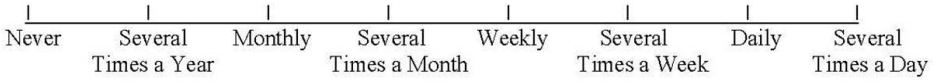
22. Circle how often you **overtly model** writing strategies.



Appendix B (Continued)

23. Circle how often you **model the enjoyment or love of writing** for students.



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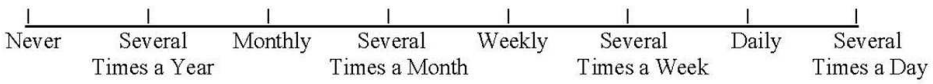
24. Circle how often you **reteach** writing skills or strategies that you previously taught.



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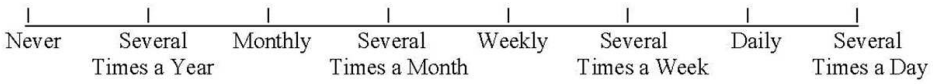
25. Circle how often you assign **writing homework** to students in your class.



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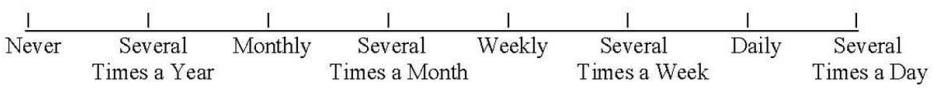
26. Circle how often your students work at **writing centers**.



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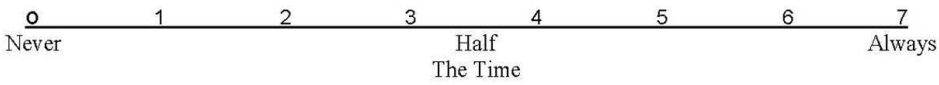
27. Circle how often your writing lessons have **multiple instructional goals**.



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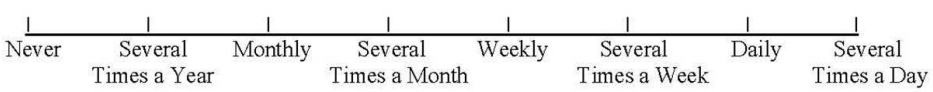
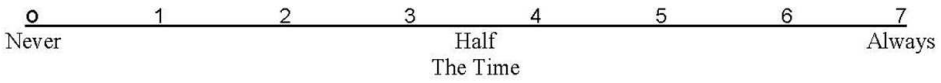
28. Circle how often you use a **writing prompt** (e.g., story starter, picture, physical object, etc.) to encourage student writing.



Appendix B (Continued)

29. Circle how often your students use a **graphic organizer** (e.g., story map) when writing.



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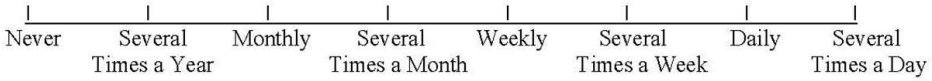
30. Circle how often **you monitor the writing progress** of your students in order to make decisions about writing instruction.



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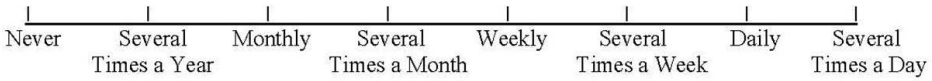
31. Circle how often you encourage **students to monitor their own writing progress**.



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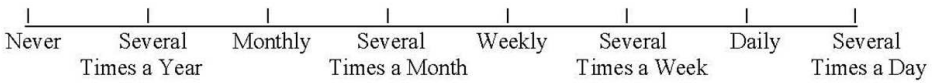
32. Circle how often students use **rubrics** to evaluate their writing.



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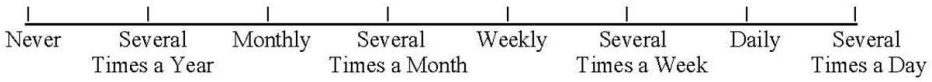
33. Circle how often students in your classroom use **writing portfolios** (add material to a portfolio, look at material already in it, and so forth).



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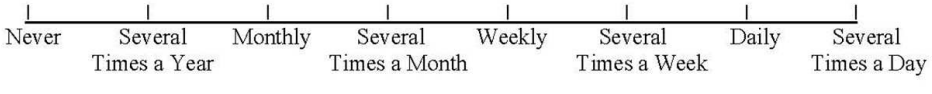
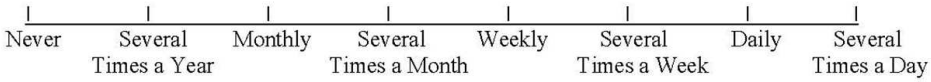
34. Circle how often you ask students to **write at home with parental help**.



Appendix B (Continued)

35. Circle how often you ask **parents to listen** to something their child wrote at school.



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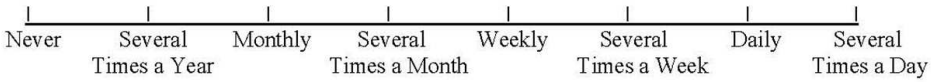
36. Circle how often you **communicate with parents** about their child's writing progress.



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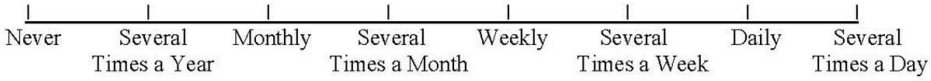
37. Circle how often you allow one or more students in your classroom to write by **dictating** their compositions to someone else.



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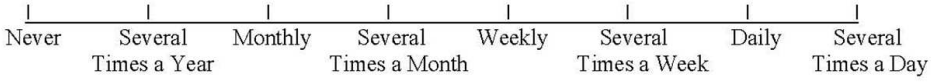
38. Circle how often you allow one or more students in your classroom to use **computers** during the writing period.



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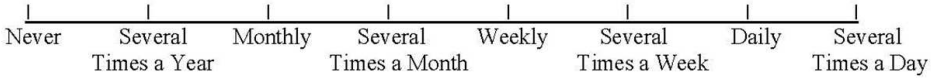
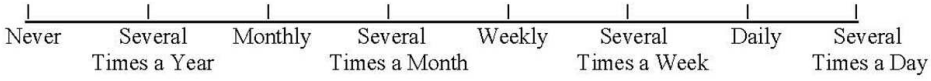
39. Circle how often students use **writing to support reading** (e.g., write about something they read).

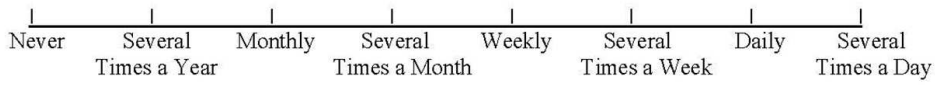


40. Circle how often students use **reading to support writing** (e.g., read to inform their writing).



Appendix B (Continued)

41. Circle how often your students use **writing in other content areas** such as social studies, science, and math.



Section 2

Please write a brief description of your writing program below:

Appendix B (Continued)

Check which of the following best describes your approach to writing instruction:

☐ Traditional skills approach combined with process writing

☐ Process writing approach

☐ Traditional skills approach

Section 3

Please put a check inside the box if you have done any of the activities below this year. For each activity, briefly describe what you have done.

☐ Students taught a strategy for timed writing.

☐ Students taught a strategy for planning a personal narrative story.

☐ Students taught the parts of a personal narrative story.

☐ Students set a goal to include all personal narrative story parts in their paper.

☐ Students assess their use of personal narrative story parts in their paper.

☐ Students taught to use self-statements.

☐ Students taught strategies to write for the writing component of the SC Ready test.

Source: Adapted from Cutler, L., & Graham, S. (2008). Primary grade writing instruction: A national survey. *PPTM* (4), 907–919.

APPENDIX C

Teacher Knowledge of SRSD Assessment

1. Provide a brief (2–3 sentences) explanation of SRSD including what the letters stand for. (2 points)
2. What is the first stage of SRSD? (1 point)
    a. Talk about it
    b. Discuss it
    c. Build preskill knowledge
    d. Activate and build background knowledge
3. What are key tasks in Stage 1? (Choose all that apply) (4 points)
    a. Develop background knowledge, pre-skills, vocabulary
    b. Collect pre-assessment
    c. Ensure that the strategy is memorized
    d. Provide an overview of the writing strategy
    e. Support students' strategy use, fading supports when ready
    f. Model and practice self/peer scoring with rubrics
    g. Introduce self-regulation (self-talk, goal-setting)
4. What is the second stage of SRSD? (1 point)
    a. Discuss it
    b. Memorize it
    c. Model and Practice
    d. Support it
5. What are the key tasks in Stage 2: *Discuss it* ? (Choose all that apply) (4 points)
    a. Provide a deeper discussion of the benefits of strategy use
    b. Internalize personalized self-statements
    c. Map models using graphic organizers
    d. Review and repair poor models
    e. Independent use of strategies and self-regulation

f. Develop goals and self-talk statements
g. Provide feedback on writing, self-regulation, and scoring guidelines, fading support when ready

6. What is the third stage of SRSD? (1 point)
    a. Memorize it
    b. Practice and Memorize
    c. Model it
    d. Discuss it
7. What are the key tasks in Stage 3: *Model it* ? (4 points)
    a. Fade overt self-instructions to covert ("in your head")
    b. Model planning and writing using think-alouds
    c. Ensure strategy is memorized
    d. Exemplify and support goal setting
    e. Collect pre-assessment
    f. Model and practice graphing routines
    g. Portray collaborative planning and writing activities
8. What is the fourth stage in SRSD? (1 point)
    a. Memorize it
    b. Read and discuss models
    c. Build background knowledge
    d. Support it
9. What are the key tasks in Stage 4: *Memorize it* ?(Choose all that apply) (2 points)
    a. Continue collaborative writing experiences
    b. Model and support goal setting
    c. Ensure strategy is memorized
    d. Independent use of strategies and self-regulation
    e. Internalize personalized self-statements
    f. Read and discuss models

g. Build collaborative partnership

10. What is the fifth stage of SRSD? (1 point)
    a. Build background knowledge
    b. Guided and independent practice
    c. Model it
    d. Support it
11. What are key tasks in Stage 5: *Support it* ? (Choose all that apply) (3 points)
    a. Map models using graphic organizers
    b. Support students' strategy use, fading support as students are ready
    c. Independent use of strategies and self-regulation
    d. Provide feedback on writing, self-regulation, and scoring guidelines, fading support when students are ready
    e. Explore when/where to use strategy
    f. Provide feedback and support for self-regulation (self-talk, goal setting, checking off steps in strategies, etc.)
    g. Internalize self-statements
12. What is the sixth stage of SRSD? (1 point)
    a. Independent performance
    b. Support it
    c. Model and Practice it
    d. Memorize it
13. What are the key tasks in Stage 6: *Independent performance* ? (Choose all that apply) (3 points)
    a. Model and practice graphing routines
    b. Build a collaborative partnership
    c. Continue collaborative writing experiences
    d. Independent use of strategies and self-regulation
    e. Fade overt self-instruction to covert ("in your head")

f. Provide strategy overview and good writing models
g. Ensure transfer and buy-in of strategies and self-regulation

14. When modeling a think-aloud, the first statement or question you should ask yourself should be related to what? (1 point)
    a. A strategy/mnemonic
    b. Your goals
    c. An organization system
    d. The problem definition
15. When do students use self-talk in writing? (1 point)
    a. Only before writing
    b. Only before during and after writing
    c. Before, during, and after writing
    d. Only during writing
16. Student writing goals should be: (1 point)
    a. Attainable —— measurable
    b. Short-term —— self-imposed
    c. Modifiable —— simple
    d. Interesting —— limited
17. Which of the following is a method used during the Support It stage to help gauge whether students are internalizing strategies? (1 point)
    a. Fading graphic organizers
    b. Color-coding rubrics
    c. Using peer score cards
    d. Repairing bad models
18. SRSD provides a _____ for writing, making conventions easier for students to learn and improve upon. (1 point)
    a. A rulebook
    b. Context

c. A framework

d. ideas

19. Each stage of SRSD represents one lesson (1 point)

☐ T ☐ F

20. A teacher must progress through the six stages of SRSD in order. (1 point)

☐ T ☐ F

21. If a student has to refer to a self-talk statement planner while writing, then the teacher knows the student has not yet internalized his self-talk. (1 point)

☐ T ☐ F

22. SRSD is not effective for students who have learning disabilities. (1 point)

☐ T ☐ F

23. The biggest pitfall in Stage 6 is getting into the stage too quickly. (1 point)

☐ T ☐ F

24. Students should have already internalized strategies by Stage 6 and should not need teacher-led review. (1 point)

☐ T ☐ F

25. In SRSD, students progress through a preset number of lessons at an established pace. (1 point)

☐ T ☐ F

APPENDIX D

Teacher Satisfaction Survey

Directions:

Choose the number that corresponds with your level of agreement for each statement.
1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree

Content Relevance

The Writing to Learn modules describe activities that I can readily implement in my classroom.

1 2 3 4 5

The Writing to Learn modules provided me with information that I will use in the future.

1 2 3 4 5

The Writing to Learn modules provided good theory, but I am not sure how they apply to my work.

1 2 3 4 5

Online Features and Delivery Quality

The online learning fits my schedule better than meeting face to face.

1 2 3 4 5

Appendix D (Continued)

The online format offers content delivery advantages over face-to-face delivery.

1 2 3 4 5

The online part of the training was more work than I expected.

1 2 3 4 5

The modules are boring.

1 2 3 4 5

It was difficult to stay motivated as I worked through the module.

1 2 3 4 5

The modules have a good balance in their text, video, and interactive tasks.

1 2 3 4 5

Navigating the modules was a clear and simple process.

1 2 3 4 5

As I worked through the online modules, I felt as though I was on information overload.

1 2 3 4 5

Appendix D (Continued)

Online Participation and Duration

I viewed the modules by myself at home.

1 2 3 4 5

I viewed the modules by myself at school.

1 2 3 4 5

I viewed the modules along with one or two colleagues.

1 2 3 4 5

Transformational Learning for Instructional Practice

I have set goals for myself regarding the implementation of SRSD instruction.

1 2 3 4 5

The content in the modules is easily adaptable to my classroom instruction.

1 2 3 4 5

I learned a great deal of practical information for my teaching as a result of Writing to Learn training.

1 2 3 4 5

Appendix D (Continued)

Other Questions

I would recommend the Writing to Learn training to my colleagues.

1 2 3 4 5

Source: Adapted from Collins, L. J., & Liang, Xin (2015). Examining high quality online teacher professional development: Teachers' voices. *Journal of Teacher Leadership, 6*(1), 18-34. Retrieved from https://files.eric.ed.gov/fulltext/EJ1137401.pdf
Reeves, T. D., & Pedulla, J. J. (2013). Bolstering the impact of online professional development for teachers. *Journal of Educational Research & Policy Studies, 1*, 50-66. Retrieved from https://eric.ed.gov/?id=ED545314

APPENDIX E

Writing Pretest Administration

Writing Pretest Administration: Cover Sheet

Date: _____

Teacher name: _____

Test administrator: _____

Time students began writing (start time): _____

Time the last student finished: _____

Number of essays collected: _____

Appendix E (Continued)

Directions for Writing Prompt Administration: Pretest

*** Before passing out materials and beginning directions, the date should be written on the board or displayed where students can see it to copy to their paper.**

*** Students should have something to do quietly at their desks when they have finished writing.**

Say: Hi. My name is _____. I am from Clemson University and I am working with your teachers on a project about writing. Today I am here to get writing samples from you so that I can learn more about how students in your grad write essays.

Say: Today you will plan and write an opinion essay. You will write an opinion essay about a specific topic. I will pass out a packet of papers in a minute that has some information for you to read and another packet with a writing prompt. There are also 2 sheets of lined paper in that packet (*pass out the writing prompt and lined paper*).

Say: You will need a pencil to write with. Raise your hand if you need a pencil. (*Pass out pencils to any student who needs a pencil*).

Say: Please look at this sheet that I gave you. (*hold up the prompt sheet so that each child can see it*). Find the words "student name." Write your first and last name on the line beside "student name." (*Monitor to make sure students write their first and last name*).

Appendix E (Continued)

Find the word "date." (**Write the date on the board or another display for students to see**.) Copy today's date on the line beside the word "date."

I will now tell you what you are going to write your opinion essay about. This page tells you about the topic of your opinion essay.

Say: I want you to read the prompt on this page silently to yourself as I read it aloud.

Read the prompt aloud:

Should parents make children your age clean their rooms?

(*You may repeat the prompt as many times as necessary. Note: Prompts must not be discussed or vocabulary words defined.)*

Say: Before you start to write your opinion essay, spend some time thinking about the topic and planning your essay. You can write your notes and make your plans on the writing topic page we just read together (*hold the prompt sheet up for students to see*).

If you need additional space to write your notes or plans, please do this on the first page of the lined pages that are stapled together.

When you write your opinion essay, please write it on the lined sheets of paper in your packet (*show them the lined paper*). You will receive no other paper. Write neatly. **Do not skip lines.**

Appendix E (Continued)

Say: If you need me to read the prompt aloud at any time, raise your hand and I will read it for you.

Your teacher or I cannot help you as you write your essay. You will have as much time as you need to finish your essay.

Say: Do you have any questions? (*Answer questions on testing only. If students ask questions as they work, just say*, **"I cannot help you. Just do your best."**)

Say: When you finish writing your essay, put your pencil down and raise your hand. Once I take your essay you may read, draw, or work quietly at your desk.

Say: Now, you may begin planning and writing.

Record the start time on the cover sheet.

Notes:

- If students ask questions or ask how to spell a word, respond **"I cannot help you. Just do your best."**
- Allow students to take as long as they need to write the essay. If are still writing beyond 40 minutes, students may be moved to another spot in the room to finish so that the teacher can continue with class activities.
- When the last student completes their essay, record the time on the cover sheet.
- Count the number of essay that you collected and record the number on the cover sheet. Place all essays, cover sheet, and directions in the envelope for that class.

APPENDIX F

Pretest

Opinion Writing Prompt

Student Name: _____

Date: _____

Should parents make children your age clean their rooms?

Use the space below to plan your essay.

Appendix F (Continued)

ID: _____

Write your essay on the lines below.

APPENDIX G

Writing Posttest Administration

Writing Posttest Administration: Cover Sheet

Date: _____

Teacher name: _____

Test administrator: _____

Time students began writing (start time): _____

Time the last student finished: _____

Number of essays collected: _____

Appendix G (Continued)

Directions for Writing Prompt Administration: Posttest

***Before passing out materials and beginning directions, the date should be written on the board or displayed where students can see it to copy to their paper**.

***Students should have something to do quietly at their desks when they have finished writing.**

Say: Hi. My name is _____. Today I am here to get writing samples from you so that I can learn more about how well you learned to write opinion essays.

Say: Today you will plan and write an opinion essay. You will write an opinion essay about a specific topic. I will pass out a packet of papers in a minute that has some information for you to read and another packet with a writing prompt. There are also 2 sheets of lined paper in that packet (*pass out the writing prompt and lined paper*)

Say: You will need a pencil to write with. Raise your hand if you need a pencil. (Pass out pencils to any student that needs a pencil).

Say: Please look at this sheet that I gave you. (*hold up the prompt sheet so that each child can see it*). Find the words "student name." Write your first and last name on the line beside "student name." (*Monitor to make sure students write their first and last name*).

Appendix G (Continued)

Find the word "date." (*Write the date on the board or another display for students to see*.) Copy today's date on the line beside the word "date."

I will now tell you what you are going to write your opinion essay about. This page tells you about the topic of your opinion essay.

Say: I want you to read the prompt on this page silently to yourself as I read it aloud.

Read the prompt aloud:

Should children your age be allowed to choose their own pets?

(*You may repeat the prompt as many times as necessary. Note: Prompts must not be discussed or vocabulary words defined.)*

Say: Before you start to write your opinion essay, spend some time thinking about the topic and planning your essay. You can write your notes and make your plans on the writing topic page we just read together (*hold the prompt sheet up for students to see*).

If you need additional space to write your notes or plans, please do this on the first page of the lined pages that are stapled together.

When you write your opinion essay, please write it on the lined sheets of paper in your packet (*show them the lined paper*). You will receive no other paper. Write neatly. Do not skip lines.

Say: If you need me to read the prompt aloud at any time, raise your hand and I will read it for you.

Appendix G (Continued)

Your teacher or I cannot help you as you write your essay. You will have as much time as you need to finish your essay.

Say: Do you have any questions?

(*Answer questions on testing only. If students ask questions as they work, just say,* **"I cannot help you. Just do your best."**)

Say: When you finish writing your essay, put your pencil down and raise your hand. Once I take your essay you may read, draw, or work quietly at your desk.

Say: Now, you may begin planning and writing.

Record the start time on the cover sheet.

Notes:

- If students ask questions or ask how to spell a word, respond "I cannot help you. Just do your best."
- Allow students to take as long as they need to write the essay. If are still writing beyond 40 minutes, students may be moved to another spot in the room to finish so that the teacher can continue with class activities.
- When the last student completes their essay, record the time on the cover sheet.
- Count the number of essay that you collected and record the number on the cover sheet. Place all essays, cover sheet, and directions in the envelope for that class.

APPENDIX H

Pretest

Opinion Writing Prompt

Student Name: _____

Date: _____

Should children your age be allowed to choose their own pets?

Use the space below to plan your essay.

Appendix H (Continued)

ID: _____

Write your essay on the lines below.

APPENDIX I

Adapted Version of the Child Intervention Rating Profile — POST

Question	I agree 🙂 1	2	3	4	5	I do not agree ☹ 6
1. I like chocolate ice cream.						
2. I like writing.						
3. Writing is hard for me.						
4. The writing program we used makes sense.						
5. My teacher encourages me to write.						
5. I get frustrated when I have to write essays.						
6. Being in the writing program caused problems with my friends.						

Question	I agree 🙂 1	2	3	4	5	I do not agree ☹ 6
7. There are better ways to teach me to write opinion essays.						
8. This opinion writing program could help other kids, too.						
9. I liked the program we used.						
10. Being in the program helped me to work better with my friends.						
11. I think this program will help me do better in school.						
12. I think being in this program helped me learn to write better opinion essays.						

Comments: _____

_____

_____

_____

Source: Adapted from Witt, J.C. & Elliott, S.N. (1985). Acceptability of classroom intervention strategies. In Kratochwill, T.R.(Ed.), Advances in School Psychology, Vol. 4, 251 – 288. Mahwah, NJ: Erlbaum.

APPENDIX J

Lesson Fidelity Observation Checklist

POW + TREE: LESSON 6 (*Support It*)

_____ 1. Test POW & TREE. Prepare to wean off graphic organizer in future. Students write mnemonic on scratch paper with POW across top and TREE down the side. Demonstrate on board.

_____ 2. Find TREE in another poor opinion essay (IF NEEDED: SKIP IF NOT OR USE WITH INDIVIDUAL STUDENTS OR SMALL GROUPS IF NEEDED).

_____ 3. Establish prior performance using scored pretest essay. (Not to worry if don't have all parts.). Each student graphs on own rocket chart. Help as needed, monitor students with scored pretests.

_____ 4. Set a goal to continue writing better papers. Remind them that powerful opinion essays tell the reader what you believe, give at least three good reasons why, use transition words, and have an ending sentence. Also, good persuasive essays are fun to write, fun for others to read, make sense, and may convince the reader to agree with you.

_____ 5. BEGIN DISCUSSING WITH STUDENTS HOW THEY CAN USE POW + TREE AT OTHER TIMES THAN IN CLASS. WHO MIGHT THEY WANT TO WRITE TO AND TRY TO CONVINCE THEM ABOUT SOMETHING? COULD YOU USE THIS FOR WRITING FOR THE SCHOOL PAPER? TO YOUR PARENTS? AS APPROPRIATE, DISCUSS HOW STUDENTS CAN USE POW + TREE WHEN THEY TAKE A WRITING TEST THAT ASKS THEM TO WRITE AN OPINION ESSAY (RELATE TO YOUR STATE OR SCHOOL TESTING).

_____ 6. Students have opportunity to respond/discussion evident.

_____ 7. Announce that a quiz will be given on the parts of POW + TREE at the beginning of the next lesson.

Number of steps possible today: _____ Number completed today: _____

Notes: _____

_____

_____

APPENDIX K

Observation of Classroom Writing Practices

Observer: _____

Date: _____

Classroom: _____

Before conducting the classroom observation, please complete items above. For

classroom, please write assigned code number for the class.

Directions for Section 1

If you observe any of the behaviors or activities noted in Section 1, place a mark through that behavior or activity. The behaviors and activities are divided into the following sections:

1. **Skills and Strategies Taught (9 items)**
2. **Common Instructional Activities in Process Writing (12 items)**
3. **Instructional and Assessment Procedures (10)**
4. **Alternative Modes of Writing (2 items)**
5. **Other**

If you observe any activity that is not included in first four sections above, write a brief description of it.

Appendix K (Continued)

Directions for Section 2

If you observe any of the behaviors in Section 2, circle that activity. These activities are similar to the procedures used in the Self-Regulated Strategy Development Model.

SECTION 1

Teacher

☐ Teacher Conferencing with Students

☐ Encouragement to Use Invented Spellings

☐ Teacher Model Enjoyment of Writing

☐ Assigned Homework

☐ Teacher Assessment

☐ Goals of Instruction Stated

Teacher (T+)

☐ Planning Strategies

☐ Revising Strategies

☐ Sentence Construction

☐ Capitalization

☐ Punctuation

☐ Grammar

☐ Spelling

☐ Handwriting

☐ Text Organization

☐ Re-teaching Skills/ Strategies

☐ Mini-Lessons

☐ Model Writing Strategies

Appendix K (Continued)

Student

☐ Students Select Own Writing Topic ☐ Students Planning a Paper

☐ Students Revising a Paper ☐ Students Sharing a Paper with Peers

☐ Students Helping Each Other ☐ Student Assessment

☐ Students Publish a Composition ☐ Computer

☐ Graphic Organizers ☐ Dictation

☐ Students Conferencing w/ Each Other

Environmental

☐ Writing Centers ☐ Writing Portfolios

SECTION 2

Activities Included in the Self-Regulated Strategy Development Model — circle any activities that you observe and provide a brief note on what happened.

Students taught a strategy for planning an opinion essay.

Students taught the parts of an opinion essay.

Students set a goal to include all opinion essay parts in their paper.

Appendix K (Continued)

Students assess their use of opinion essay parts in their paper and graph results.

_____

_____

Students taught to use self-statements.

_____

_____

APPENDIX L

Student ID: Scorer:

Number of Words Written	Elements of Opinion Writing

Number of Words Written: Highlight the essay. Use the Microsoft Word word count tool to determine the total number of words written. Record the number of words written in the table.

Elements of Opinion Essay Rubric (Posttest)		
TREE	**Description**	**Score**
Topic		
	Includes a hook	1
	Tells what he or she believes	1
		/2
Reasons and Explanations		
Reason #1	Provides a reason	1
	Uses a transition word or phrase	1
	Support reason with explanation/details	2
Reason #2	Provides a reason	1
	Uses a transition word or phrase	1
	Support reason with explanation/details	2
Reason #3	Provides a reason	1
	Uses a transition word or phrase	1
	Support reason with explanation/details	2
		/12
Ending		
	Includes ending	1
	Ending restates reasons	1
		/2
Total		**/16**