An Examination of the Design Principles Underlying a Self-Regulated Strategy Development Study

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Abstract: This article presents the design principles underlying the instruction provided in a Self-Regulated Strategy Development (SRSD) study that resulted in substantial improvements in the opinion writing of second and third grade students. The analysis focused on the SRSD instruction students received in the classroom as well as the practice-based professional development (PBPD) teachers received on how to implement SRSD for opinion writing. A newly developed model of writing that draws on both social/contextual and cognitive conceptualizations was used to identify the theoretical aims, instructional focuses, and corresponding instructional activities for (1) creating a PBPD community where teachers learned to apply SRSD for opinion writing, (2) reshaping teachers' classrooms so that these writing communities were conducive to SRSD instruction, (3) strengthening the capabilities and motivations of teachers to provide SRSD instruction for opinion writing, and (4) improving the capabilities and motivations of students to compose more convincing opinion essays. This analysis is the most comprehensive examination of SRSD instruction presently available, providing greater clarity for researchers and practitioners on how this instructional approach operates and achieves its aims. Our analyses also demonstrated that there is a high degree of interconnectivity among the instructional activities underlying SRSD, as many of them are designed to meet multiple aims, cutting across professional development, classroom instruction, and student and teacher development.

Keywords: writing, instruction, self-regulated strategy development, design principles

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This article provides an analysis of the design principles underlying the Self-Regulated Strategy Development model (SRSD; Harris & Graham, 1988; Harris, Graham, Mason, & Freidlander, 2008), including the Practice-Based Professional Development model (PBPD; Harris et al., 2102) Harris and Graham currently use to teach educators how to apply SRSD. While SRSD can and has been applied in multiple academic domains (e.g., Case, Harris, & Graham, 1992 in mathematics; Mason, 2004 in reading), we limit our analysis here to writing.

SRSD was developed by Karen Harris in the 1980s, and at that point it was referred to as self-control strategy training (Harris & Graham, 1985). Over the years, SRSD has undergone various transformations to make it more effective (greater emphasis placed on enhancing students' attributions for success for example; Sexton, Harris, & Graham, 1998). Today, SRSD instruction in writing is an approach for teaching students to apply task specific strategies for carrying out composing processes like planning, drafting, and revising. Students learn to apply specific writing strategies, acquire the knowledge needed to use these strategies successfully, and learn to regulate the use of these strategies, the process of writing, their writing behaviors, and their motivations for writing. Basically, SRSD is a complex instructional intervention designed to influence multiple aspects of students' know-how and performance (Harris & Graham, 2009). In essence, SRSD is designed to provide students with relevant knowledge and positive dispositions (held in long-term memory), improve students' writing production processes (e.g., conceptualization and ideation), enhance their executive control over taught writing strategies and self-regulation procedures, and address psychological factors that may impede or facilitate writing performance (see also Koster & Bouwer, 2018 this issue for a writing program with many similar goals).

To date, over 100 studies have examined the effectiveness of SRSD in writing, and this instructional approach has produced the largest average effect sizes (ES) for writing quality of any writing intervention tested in at least four or more true- or quasi-experimental studies. With students in grades four to 12, a meta-analysis by Graham and Perin (2007) found SRSD had an average weighted effect (ES) size of 1.14 for writing quality (the next largest ES for a writing intervention was 0.82). With elementary grade students, a meta-analysis by Graham, Kiuhara, McKeown, and Harris (2012) reported an ES of 1.17 for writing quality (the next largest ES for a writing intervention was 0.89). It has been an effective intervention with typically developing writers as well as a broad range of students who experience learning and behavioral difficulties (Graham, Harris, & McKeown, 2013).

It is especially important to note that students' gains in writing are just as strong when teachers deliver SRSD as when researchers provide this instruction. Students taught SRSD by their teacher evidenced an effect size of 1.52 for writing quality. This did not statistically differ from the effect size for writing quality obtained in studies where research staff delivered instruction (Graham et al., 2003).

As with any instructional approach, quality teaching is central to the success of SRSD (National Academy of Education, 2009). With a relatively new approach to instruction

like SRSD, this necessitates providing effective professional development (PD) to teachers. However, PD can take many forms, ranging from an in-service workshop that provides advice to teachers that is not directly connected to their specific students and classroom practices to more extensive learning opportunities where teachers learn to apply and practice instructional procedures with a focus on their instructional context and the needs of their students. While our goal from the start has been to provide the latter type of PD, during this past decade we have operationalized this goal by using a PBPD approach to teach educators how to use SRSD in their classroom (see Festas, Oliveira, Rebelo, Damião, Harris, & Graham, 2015; Harris, Graham, Adkins, 2015; Harris et al., 2012a, 2012b; McKeown, 2016, 2017). This approach to PD was greatly influenced by the PBPD approach described by Ball and others (cf. Ball & Cohen, 1999; Grossman & McDonald, 2008).

The PBPD approach we apply is designed to (1) create a supportive community where teachers can learn to apply SRSD effectively, (2) help teachers modify their own classroom environment so that it is conducive to SRSD instruction, and (3) provide teachers with the knowledge, understanding, skills, and beliefs needed to teach SRSD effectively and efficiently in their classrooms to their individual students (this is done by helping them acquire relevant knowledge and positive dispositions which are held in in long-term memory, use writing production processes to personalize SRSD instruction for their classroom; develop executive control over SRSD instruction, and increase enthusiasm to teach SRSD).

In this article, we revisit a study that applied SRSD with second and third grade students (Harris et al., 2012a). This study is first described, paying particular attention to how SRSD and PBPD were actualized. Next, the writer(s) in community model (Graham, 2018) is presented, providing a theoretical foundation for presenting the basic design principles underlying SRSD and PBPD in this investigation. Then, using this model as our touchstone, we identify the basic theoretical aims that SRSD and PBPD are designed to address in the Harris et al. (2012a) study as well as focuses of instruction and the accompanying instructional activities.

1. Teaching Planning/Drafting Strategies with SRSD

The Harris et al. (2012a) study analyzed in this article involved a randomized control trial where 20 second and third grade teachers received PBPD (2 full days of PD with follow-up assistance every third day of teaching) in using SRSD to teach either story or opinion writing. Half of the teachers were randomly assigned to teach opinion essay writing; the other teachers taught story writing. In both conditions, instruction centered on teaching students strategies for planning and writing in the pertinent genre; all teachers were taught how to deliver SRSD instruction using PBPD with follow-up support. SRSD/PBPD story writing instruction served as a control for SRSD/PBPD opinion writing instruction and vice versa. It was not expected that instruction for writing in one genre (e.g., opinion writing) would generalize to the other genre (i.e.,

story writing) to any great degree, as the main focus of instruction was students learning to generate and organize ideas for writing using the basic structural elements of the target genre. These structural elements differ considerably in opinion and story writing (Stein & Albro, 2011; Stein & Glynn, 1979). Moreover, previous SRSD research did not find that teaching one of these genres improved the other (e.g., Graham & Harris, 1989).

The Harris et al. (2012a) study took place in elementary schools collaborating with a local university to implement an evidence-based, three-tiered model of prevention and supports that addressed academic, behavioral, and social goals (Lane, Menzies, & Kalberg, 2012). SRSD instruction was delivered by regular classroom teachers to the whole class (Tier 1 of the three-tiered model of prevention; each class had approximately 20 students). Following PBPD, teachers implemented SRSD instruction with fidelity (three times a week for 30 minutes for no more than eight weeks), and there were significant and meaningful changes in students' writing outcomes for both opinion and story writing. For opinion writing, the ES for writing quality was 4.00, whereas the ES for opinion essay elements was 2.02. The ESs for story writing quality and story elements were 0.77 and 1.09, respectively.

1.1 SRSD Instruction

SRSD instruction involves six recursive stages of instruction: develop background knowledge, discuss it, model it, memorize it, support it, and independent performance. These stages of instruction are designed to teach students task-specific strategies as well as the self-regulation procedures, knowledge, and positive beliefs needed to apply writing strategies effectively and independently. It is important to note that SRSD instruction is discourse rich, applies a gradual release model where teachers first model how to use strategies but move deliberately to independent student application, and stresses maintenance and generalization of the procedures taught.

The theoretical rationale underlying the six recursive stages of SRSD, the use of self-regulation procedures, the application of a gradual release model, discourse rich instruction, and emphasis on promoting maintenance and generalization are described in Harris and Graham (1992). To summarize, students are taught up front the knowledge and skills they need to use the target writing strategies (i.e., develop background knowledge). This helps to ensure that they can learn to apply them effectively. Before the target writing strategies are modeled and students begin to apply them, they discuss the purpose and rationale behind each strategy (and self-regulation procedures) as well as when and where to use them (i.e., discuss it). This helps ensure they understand what they are learning, why it is important, and when it should and how it should be used (these themes are returned at other points in instruction to foster maintenance and generalization). They are also taught simple mnemonics designed to facilitate remembrance of the basic mental process they carry out while using the target writing strategies. This helps to ensure these basic processes are not forgotten when students are writing. The teacher applies a gradual release model (model it, support it,

and independent practice), where she initially takes the lead role in applying the writing strategies and self-regulation procedures, gradually releasing control to students until they can applies these procedures effectively and correctly. This scaffolds the learning process through both social and material support to help ensure students learn to master use of the writing strategies and self-regulation procedures.

Further, the self-regulation procedures (e.g., goals setting, self-monitoring, self-instructions, and self-reinforcement), in turn, provide mechanisms that help students activate and orchestrate the target writing strategies, students' writing behavior, and the writing process. This makes it more likely students will successfully and purposefully apply the target writing strategies, be more positive about writing, and more confident in their own writing capabilities. The rich discussion between teacher and students and between students throughout SRSD instruction provides the teacher with a vehicle to check students' understanding and provide additional instruction as needed. It also helps students develop a more nuanced understanding of what they are learning as they are exposed to not only the perspectives of the teachers but their fellow classmates (see also De Smedt & Van Keer, 2018; Grabowski, Mathiebe, Hachmeister, & Becker-Mrotzek, 2018; Lopez, Rijlaarsdam, Torrance, & Fidalgo, 2018 this issue).

Collectively, the instructional procedures described above provide the mechanisms for achieving four basic aims for enhancing the cognitive resources and processes students bring to specific writing tasks. As students are taught to carry out task-specific writing strategies and self-regulation procedures via SRSD, they (1) acquire the needed knowledge and dispositions (held in long-term memory) to use these procedures effectively; (2) master specific writing production processes like planning, evaluation, and revising; (3) learn how to exert executive control over the inculcated writing strategies, the writing process, and their writing behavior; and (4) gain discipline over psychological factors that may impede or facilitate their writing performance.

In the Harris et al. (2012a) study that is the focus of this article, students in both conditions learned **POW** (**P** = Pick my idea, **O** = Organize my notes, **W** = Write and say more), which is a general strategy for organizing the writing process. They then learned a genre-specific planning/writing strategy for either opinion or story writing. Students were asked to apply the genre specific-strategy as they activated the second step in **POW** (**O** = Organize my notes).

The genre-specific strategy for students assigned to SRSD for opinion writing was **TREE**. This strategy prompted students to generate notes in advance of writing for the following basic genre elements: **T**- Topic sentence, Tell what you believe!; **R** – Reasons, 3 or more, Why do I believe this? Will my readers believe this?; **E** – Ending, Wrap it up right!; **E** – Examine, do I have all my parts?).

The genre-specific strategy for stories was **WWW**, **What** = 2, **How** = 2. This strategy encouraged students to generate notes for basic story elements in advance of writing: **W** = Who is the main character or characters?; **W** = When does the story happen? **W** = Where does the story take place?; **What** = What does the main character do or want to do? What do other characters do?; **What** = What happens then? What happens with

other characters?; **How** = How does the story end?; **How** = how does the main character feel? How do other characters feel?).

Together **POW** and the genre-specific strategy served as schemas for planning and writing a paper in a specific genre. This included conceptualizing the writing task, generating and organizing possible ideas for the paper, and expanding and revising the initial plan while writing. We illustrate SRSD instruction in the Harris et al (2012a) study by describing the six stages of instruction for **POW** and **TREE** below. This is the focal point for our analysis of the design principles underlying SRSD in the Harris et al. (2012a). SRSD instruction for story writing was identical to opinion writing instruction except the **WWW, What = 2, How = 2** strategy was taught, materials used during instruction were for story writing, and million dollar words (sophisticated vocabulary), not transition words, were emphasized.

Develop background knowledge. During this first stage of instruction, students acquired the knowledge, skills, and vocabulary needed to apply **POW** and **TREE**. The teacher introduced **POW** and described its three corresponding steps, discussing with students why each step was important. They then focused on the characteristics of a good opinion essay by reading and discussing good examples of opinion essays written for young children (this included focusing on traits such as ideation, organization, sentence variety). Questions posed by the teacher included, but were not limited to: What is an opinion? What are the parts of an opinion essay? How do you think the author came up with this idea? How did the author organize their ideas? How did the writer grab the readers' attention? What kinds of words did the author use?

Teacher and students generated a list of the characteristics of a good essay (e.g., easy to follow, fun to read), including a clear statement indicating the writer's belief, reasons that support this belief, an ending. Next, the teacher introduced **TREE** as a "trick" for remembering the parts to be included in an opinion essay as well as a tool for generating an initial plan for writing the paper. Vocabulary important for writing an opinion essays (e.g., fact vs. opinion, transition words) was carefully discussed. After discussing with the teacher the parts and vocabulary of opinion essays, students listened as a model opinion essay was read. As a group, they identified each of the parts of an opinion in the composition. This continued with additional essays until students could identify all of the respective parts. Consistent with the recursive nature of SRSD instruction, teacher and students spent a few minutes during succeeding lessons reviewing the steps of **POW** and **TREE**, and discussing the purpose for each step in these two strategies.

Discuss it. During this stage of instruction, students continued to examine opinion essays (including models of poor opinion essays), as a class or independently, highlighting the characteristics of an opinion essay presented in the previous stage (e.g., topic sentence, three or more reasons, transition words, ending) and taking notes for each of these parts on a graphic organizer (this was the same graphic organizer they would use to plan their essay using **POW** and **TREE**). As a group, students also discussed how they currently wrote, managed or self-regulated the process of writing,

their attitudes and beliefs about writing, what they say to themselves as they write, and how each of these things might help or hinder them as they compose. They also discussed how the **POW** and **TREE** strategies would be beneficial to them.

The class sets overall goals for writing (e.g., fun to read, fun to write, makes sense, and convinces the reader). They also set a goal to write an opinion essay with at least five parts (e.g., topic sentence, three reasons, and ending). The teachers further asked students to make a commitment to learning the strategies and working in partnership with the teacher and other students. As a group, the class discussed the importance of effort and strategy use when writing.

Model it. Teachers modeled aloud how to plan and write an opinion essay using **POW** and **TREE** in response to a specific writing prompt (e.g., Should children your age have to do chores at home?). To illustrate, the teacher first modeled setting goals for their essay (e.g., include at least five parts, transition words, etc.). Then, the teacher modeled **P** (pick my idea: "Yes, I think children should do chores; that is what I believe."). Next, the teacher modeled **O** (organize my notes) by using the **TREE** strategy, writing notes for the paper on the graphic organizer introduced in the previous stage of instruction. Students helped the teacher generate and evaluate possible ideas for these notes. Finally, the teacher modeled **W** (write and say more), by using the notes on the graphic organizer to write the opinion essay and making changes to the initial plan developed with **TREE**; again students assisted the teacher.

While modeling the use of the writing strategies, the teacher also modeled using self-instructions for different purposes including goal setting (e.g., "I need to include five parts."), problem solving (e.g., "What do I have to do now?"), self-evaluation (e.g., "Do I have all my parts?"), self-reinforcement (e.g., "This is good. My reader will agree with me."), and coping (e.g., "I can do this if I try. This isn't so bad."). After the teacher modeled how to plan and write the essay, the class discussed the different self-instructions used by the teacher while writing, making sure to emphasize how what she said helped her when planning, writing, and checking her work. Students then generated and recorded their own self-statements on a sheet of paper to use during the writing process. To facilitate this process, they were prompted to think of one or more statements they could use in the following categories: think of good ideas, while I write, and recheck my work. The teacher examined each child's self-statements to be sure that anything proposed was appropriate.

Next, students were introduced to the self-monitoring procedures. Students were provided with a rocket graphing sheet. Each rocket was divided into five parts (one for each of the major elements in **TREE**) and surrounded by stars. Students were reminded that the teacher set a goal to include at least five parts in the essay. Together, teacher and students examined the essay to identify parts and transition words, and colored in a box and a star on their rocket for each part and transition word, respectively. The teacher restated the established goals for writing, and encouraged students to include all five parts and transition words when writing an opinion essay in the future. The

teacher indicated students could "bust" the rocket if they included more than three good reasons, and told them to write their total number of parts on top of the rocket.

In addition, the teacher and students considered other tasks and situations where they could use the procedures and strategies modeled by the teacher. This was aimed at promoting maintenance and generalization of the strategies modeled and was emphasized in succeeding stages of instruction. Examples of tasks and situations identified by the students included: using **TREE** to persuade their parents, self-monitoring to keep track of how many words they spelled correctly on spelling tests, planning in advance an upcoming play date, and setting a goal to use **POW** and **TREE** in other classes.

Memorize it. Students memorized the steps in **POW** and **TREE** as well as the purpose of each step. This ensures that students do not need to rely on external memory aids (e.g., a chart with the strategy written on it) when they move to independent performance. Memorization of these strategies began during the develop background knowledge stage as students practiced remembering this information for a few minutes at that point, and this continued through the other instructional stages. Teachers developed games (e.g., using flash cards), songs, or hand motions to help students memorize **POW** and **TREE**. Students did not move to the next stage of instruction (support it) until they had memorized both strategies and the purposes of each step. The teacher orally queried students to determine mastery of this material.

Support it. Teacher and students worked collaboratively to write opinion essays using the **POW**, **TREE**, and the self-regulation strategies. The teacher gradually faded support as students moved to greater independence using these procedures. For instance, once students were able independently write essays using the graphic organizer, the teacher modeled how to make your own graphic organizer on scratch paper and use it to plan an essay. The class discussed why it was important to generate your own graphic organizer for writing opinion essays, instead of relying on one given to you by someone else. The class also identified and discussed other times, places, and reasons for using the strategies in other contexts. This included how to modify the procedures for use in these situations and encouragement to do so.

During this stage of instruction, the teacher met individually with some students to collaboratively establish challenging goals for them to meet as they practiced using **POW**, **TREE**, and the self-regulation procedures. These goals mainly centered on genre (e.g., including more than three reasons) or the characteristics of good writing (e.g., using words that make concepts more interesting).

Independent performance. Students reached independent performance when they were able to use **POW**, **TREE**, and the self-regulation procedures they were taught to independently and effectively write opinion essays that met criteria (e.g., included all five parts, transition words, etc.). The class continued to discuss other times when the writing and self-regulation procedures taught can be used and developed plans to maintain use of the writing strategies. Students again identified places to use instructed

procedures, considered how they would need to be modified, and were encouraged to apply them in these new settings.

1.2 PBPD

The PBPD used to prepare teachers to deliver the SRSD instruction described above was consistent with research on effective PD as well as with research on PBPD approaches more generally (see Ball & Cohen, 1999; Desimone, 2009; Garet, Porter, Desimone, Birman, & Yoon, 2001; Grossman & McDonald, 2008; Koster & Bouwer, 2018). Harris et al. (2012a) focused on developing teachers understanding and ability to apply SRSD effectively versus a more narrow concentration on knowledge about a practice (which often occurs in PD). The following attributes characterized the PBPD that teachers in this study received: (a) collective participation of teachers within the same school with similar needs; (b) PD based around the characteristics, strengths, and needs of the students in teachers' classrooms; (c) attention to the content and pedagogical knowledge teachers need to implement SRSD; (d) opportunities for active learning and practice of the methods being learned, including opportunities to see and analyze examples of the methods being taught; (e) use of materials and other artifacts during PD identical to those that will be used by teachers in the classroom, and (f) feedback on performance while learning and before using these methods in the classroom.

The theoretical rationale underlying PBPD as we have operationalized share many similarities with the theoretical basis underlying SRSD. Teachers are taught the content and pedagogical information needed to teach SRSD (just as students are taught the knowledge and skills need to use the target writing strategies. This helps ensure that teachers can apply SRSD effectively. Before teachers apply SRSD in the classroom, the instruction they are to deliver is modeled and discussed, and they practice applying these procedures with each other using the same material they will apply in the classroom, receiving feedback and assistance as needed. This scaffolding which is similar to the gradual release model used with students, and it is designed to provide teachers with the social and material support needed to ensure teachers can apply SRSD effectively. In addition, emphasis is placed on how to make SRSD instruction work within the context of teachers' schools and class to ensure that the provided instruction is relevant to students and teachers' specific situations.

As noted earlier, PBPD as applied in our SRSD studies are designed to achieve three related aims. This includes creating a supportive community where teachers can learn to apply SRSD effectively, helping teachers change their classroom environment so that it is conducive to SRSD instruction, and providing teachers with the cognitive resources needed to teach SRSD effectively and efficiently in their classrooms with their individual students.

With teachers at each of the participating schools, Harris et al. (2012a) formed writing teams for PD (each school had one team for opinion writing which was led by a team leader from our research group). Within these teams, teachers shared their

students' current writing performance, strengths, and needs. They also read and discussed summaries of research and practice involving SRSD. They further observed exemplar SRSD instruction and practiced applying SRSD for opinion writing (with feedback), using the same materials they would use in their class. As they implemented SRSD instruction with their students, they were observed and received ongoing support as needed.

The PBPD delivered purposively mirrored the six stages of SRSD instruction described previously. The size of the PD teams (no more than 5 teachers) allowed for collective, active participation of each participant, and made it possible for the leader of each team (an experienced SRSD instructor) to know each teacher well and understand their strengths, goals, and needs.

Develop background knowledge/discuss it. PBPD began with teachers describing their previous PD, practices, and experiences teaching writing. All teachers reported insufficient preparation to teach writing. Each teacher had participated in PD for implementing a whole-language reading and writing workshop two years earlier, but indicated students' writing did not progress in line with school, district, and state goals, despite efforts by all to implement the program with fidelity. Teachers shared writing from their classroom, and talked about their students' writing strengths and needs, the range of writing abilities in their class, and their writing goals for students in general and in opinion writing specifically. The team leader returned to these themes throughout PBPD to better anchor PD in teachers' needs and goals (the importance of needs assessments and resulting instructional activities are also examined in Link, 2018 this issue).

Each team leader also shared her experiences teaching SRSD with second and third grade students as well as samples of student writing before and after SRSD instruction, providing concrete examples of the growth in students' writing that teachers might expect.

A summary of the research and theoretical base for SRSD was provided to further enhance teacher buy-in (although all teachers had agreed to participate in this PBPD) and to emphasize the need for explicit, scaffolded instruction in writing strategies and self-regulation procedures as well as the need for ongoing development in each of these areas over time and across grades. The team discussed the general characteristics of effective writing at second and third grade as well as the essential genre elements for an opinion essay. Additionally, each teacher shared writing practices they used and found effective in their class (e.g., peer support and aspects of writer's workshop). As a group, they considered how these instructional practices were consistent with the goals of SRSD, and it was emphasized that teachers could and should integrate these as desired into SRSD lessons. For example, one teacher who emphasized peers working together had students test each other to determine if students new the steps and purposes in POW and TREE. A second teacher who emphasized using music as a tool for learning had students develop a rap song to remember the mnemonics. Another teacher who

emphasized the visual learning had students write their self-statement on paper leaves, and the class developed a tree on the classroom wall filled with these leaves.

Each teacher was provided with a SRSD instructional notebook, including lesson plans covering the six stages of SRSD instruction as well as all of the instructional supports they and their students would use (e.g., strategy charts, self-statement records, rockets for graphing student essays, bulletin board ideas for displaying the strategies or student writing, graphic organizers). It was emphasized that the lesson plans were for professional learning and discussion only, and were not to be used as scripts. Teachers developed their own lesson plans when they were ready to do so at later stages of instruction.

The team watched a commercially produced, one-hour video of SRSD instruction (ASCD, 2002). The video follows two teachers and their students through all six stages of SRSD instruction. The video was stopped at several places to hold discussion and answer questions. Beginning here, and throughout PBPD, the team leader probed and confirmed teachers' understanding of key vocabulary, constructs, and elements of SRSD instruction.

Model it. The team leader modeled aloud each lesson in turn (often in parts), with teachers acting as students. The team discussed the lesson or parts of the lesson modeled and how it was delivered by the team leader, including that the lesson may take more than a single day to deliver (instruction is mastery not time-based, and it was emphasized that different teachers may require more time to implement a lesson than other teachers). It was again emphasized that lesson scripts were too cumbersome to teach from, and teachers would later develop their own, personalized, briefer lesson plans. The team also discussed the importance of differentiating writing instruction (making adjustments in instruction so that it was effective with all students in the class), and brainstormed how this could be accomplished.

Support it/Independent performance. After a lesson was modeled, teachers worked in pairs or small groups under the direction of the team leader to practice the lesson, taking turns acting as teacher or student(s). The team leader circulated, observed, and assisted as needed. As a group, the team discussed practicing the lesson to better improve their skills to do so. This included proactive brainstorming and problem solving focused on effective adaptations of each lesson to meet students' needs.

To further facilitate independent and effective use of SRSD, teachers developed and practiced their own briefer lesson plans for each lesson. They also developed a plan for how they would model the writing and self-regulation strategies they would teach to their students.

Ongoing observation and support. Approximately, every third day writing was taught, an SRSD trained member of our research team observed each teacher implementing SRSD. Observers provided teachers with ongoing feedback and support. They answered teachers' questions and discussed the lesson with the teacher immediately afterwards or later by phone or email. We particularly stressed that it was important for teachers to adapt instruction for their students, but that all major elements

and steps of SRSD instruction should still be included. Teachers in a team also met together formally on a weekly basis to discuss and support each other.

2. From Theory to Design Principles

The initial conceptualization of SRSD (see Graham & Harris, 1996) was based on Donald Meichenbaum's (1977) work on cognitive-behavior modification; the thinking of Soviet theorists L.S. Vygotsky, A.R. Luria, and A.N. Sokolov (Vygotsky, 1962; Wertsch, 1979) spanning verbal self-regulation, the social origins of self-control, and development of the mind; Donald Deshler and Jean Schumaker's (1986) research on how to teach learning strategies; and Ann Brown and Joseph Campione's investigation of self-control, metacognition, and critical elements of strategy instruction (Brown & Campione, 1990).

During the 1980s, Graham and Harris (e.g., Graham, 2006) linked SRSD to Patricia Alexander's model of domain learning (Alexander, 1997, 1998). The central tenet of this model was that learners move incrementally from a state of initial learning in a domain (i.e., acclimation) like writing to a state of competence which is obtained when a learner acquires a principled body of knowledge that can be applied to domain relevant situations and tasks. While learner's growth within a domain like writing is clearly individualistic and variable (Bazerman et al., 2017), Alexander (1997) proposed that there are predictable catalysts that drive growth in all domains. This included changes in a learner's strategic behavior, knowledge, and motivation. Accordingly, movement from acclimation to competence in writing arises from students becoming more strategic, knowledgeable, and motivated. SRSD is designed to enhance each of these catalysts (see Harris et al., 2006).

In this paper we draw on a new theoretical model to analyze the design principles underlying SRSD. This new model was developed by Graham (2018) and views writing and its development through a social/contextual and cognitive lens. This does not invalidate previous analyses of SRSD using different theoretical models. Instead, this new model of writing better represents Harris and Graham's evolving views of writing and its development, which have influenced changes in SRSD over time and the development of PBPD. This new model also provides a broader platform on which to link writing theory and principles of design underlying SRSD and PBPD.

3. Writer(s) in Community Model

3.1 Writing Community

The Writers in Community model is based on the assumptions that writing is a social activity, situated within the context of many different writing communities (Graham, 2018). This can range from a fourth grade language arts class to a group of friends using writing to communicate on social media. A single writing community can include many people (e.g., writers and readers) or just a single individual, as when a person

writes a diary for his or her eyes only. Writing does not have to be the only or even the most central feature of a writing community, but writing must take place. A writing community then involves one or people who share basic goals and assumptions and use writing to achieve their purposes. In the Harris et al. (2012a) study, we focused our attention on two different types of writing communities: the PBPD writing community that was created and teachers' classrooms.

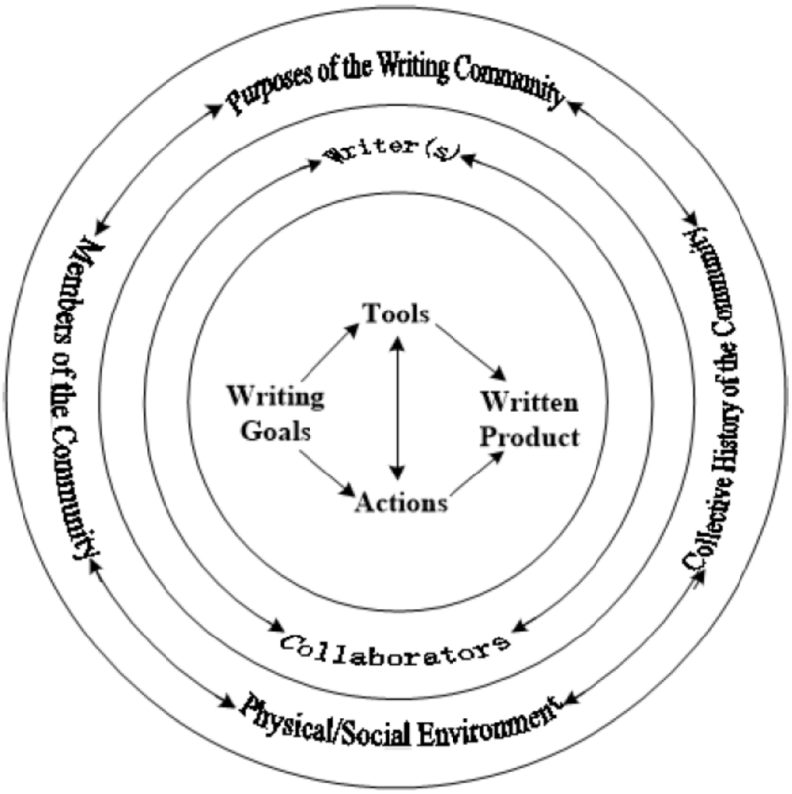

Figure 1: Basic Components of a Writing Community.

A central component of a writing community is the purpose for how writing is used (writing community and its components are depicted visually in Figure 1). This includes the goals writing is intended to achieve, the value of different writing activities to the community, norms for what constitutes specific types of writing, stance/identity the community wants to project, and the community's audience. Purposes can range in intent from communities where the primary goal is to foster students' writing growth to a PD community designed to enhance teachers' knowledge and skills to teach writing.

A community must have one or more members. In a classroom, this can include writers, teacher(s), mentors, collaborators, and readers. In a writing community with multiple members, such as a classroom, members can and are likely to differ in their familiarity with the purposes and practices of the community; level of participation and affiliation, roles and responsibilities, identities as writers, and presumed value and power of individuals within a community.

The purposes or goals of a writing community are accomplished through the use of tools and through recurring actions. In a classroom, tools include the different types of machinery, sources, and artifacts writers and collaborators draw on to create writing (e.g., word processing, informational text, past drafts of a paper, respectively) as well as the tools, sources, and artifacts teachers apply when teaching writing (e.g., modeling, lesson plans, and model text, respectively). Actions are the typical practices employed by members to achieve community goals. In a classroom, this includes activities that students and teachers engage in to define writing tasks, structure the writing environment, distribute responsibility, execute the process of composing, and manage the social, motivational, emotional, and physical aspects of writing.

Graham (2018) also argued that what happens in a writing community does not occur by happenstance, but is shaped by a collective history as well as the social context in which its members operate. For instance, as a classroom engages in writing over time, aspects of the writing culture become more fully codified (this is also shaped by macro-forces outside of the classroom such as institutional, cultural, political, social, and historical factors). Collective history shapes what is written, who is the intended audience, how writing is viewed and valued, what constitutes good writing, how writing is produced, and how it is taught. The social dimensions of the classroom also become more defined over time, as social and power relationships become established as do students' identities as writers, sense of belonging, perceived values, roles, and responsibilities.

Writing communities also take place in a physical context, which can include a digital locale such as Facebook. These locales influence how many members of a community can be present at any given time, the types of tools available, how writing is enacted, and even the goals set by a community (e.g., digital environments can increase the reach of a community).

The multiple components of a writing community described above and their interactions shape and bound classroom writing and the teaching of it. They influence the type of writing undertaken, how it is produced, and how writing is taught. Graham's (2018) conceptualization should not be interpreted to mean that the components of a writing community are static, permanent, or homogeneous. They are emerging and not fixed entities and contradictions, disparate elements, conflict, and multiple voices will exist.

Finally, as writing communities are created or evolve, they are shaped by other socially-derived communities, including other writing communities. For example, the type of writing and learning that occurs in a family writing community consisting of a

five year old child and her parents may be predicated, at least in part, on acquiring writing knowledge and skills assumed to be important at school. Thus, writing communities operate and function across integrated networks (Bazerman & Prior, 2005), and cannot be adequately understood in isolation. One way that this was the case in the Harris et al. (2012a) investigation we examine in this article is the reciprocal relation that existed between the PBPD writing community and teachers' classrooms.

3.2 Community Members

Graham (2018) contends that writing is not only shaped and bound by the community in which it takes place, but it is also shaped and bound by the cognitive capabilities and resources of those who create it (and teach it). In essence, writing involves the reciprocal interaction between the context in which it occurs in conjunction with the mental and physical actions of those who produce it. Individual writers and their collaborators (which include teachers and mentors) are the keys that drive the engine and fuel the process of writing and learning how to write within a specific community.
One implication of these contentions is that writers (and collaborators) are not driven solely by the purposes and conventions of the communities in which they operate, but they possess agency to make decisions about writing and learning to write within these communities. When creating text, for example, writers make multiple decisions that drive and shape what they write, just as writing teachers make multiple decisions that influence how and what is taught. While these decisions are bound by context, they are not inexorably anchored to it.

Another implication is that the cognitive capabilities and resources of writers and their collaborators are not identical (or constant for that matter). Individuals differ in what they bring to the task of writing and learning to write. This includes not only differences in what they have learned and believe about writing, but also differences in cognitive architecture (e.g., individual differences exist for example in attention or working memory; Pass & Sweller, 2014). Further, inherent limitations in human cognitive architecture constrain the process of writing, as writing does "not simply unfold automatically and effortlessly in the manner of a well learned motor skill" (Kellogg, 1993, pg. 17). Instead, it is a very complex skill that requires coordination of a wide range of cognitive processes, including attention, motor, memory, executive functioning, and language skills (Hayes, 2006). These processes operate within a cognitive apparatus that is not infinite, but possess specific limitations in terms of processing capacity and capabilities (Mayer, 2012). If the cognitive actions of a writer exceed the capacity of their processing system, which is more likely in less skilled than more skilled writers (Graham, 2006), then cognitive overload is likely, and one or more aspects of writing may be affected (as when trying to figure out how to spell a word leads to forgetting a writing idea held in working memory).

While Graham (2018) indicated that individual differences in cognitive capabilities and resources influence what a writer wants and can do, the basic cognitive components involved in writing are universal (these cognitive components are

presented for a single member of a writing community in Figure 2). A writer's collaborators draws on these same cognitive components. We first illustrate these components by focusing on an individual writer, and then turn to other members within a writing community.

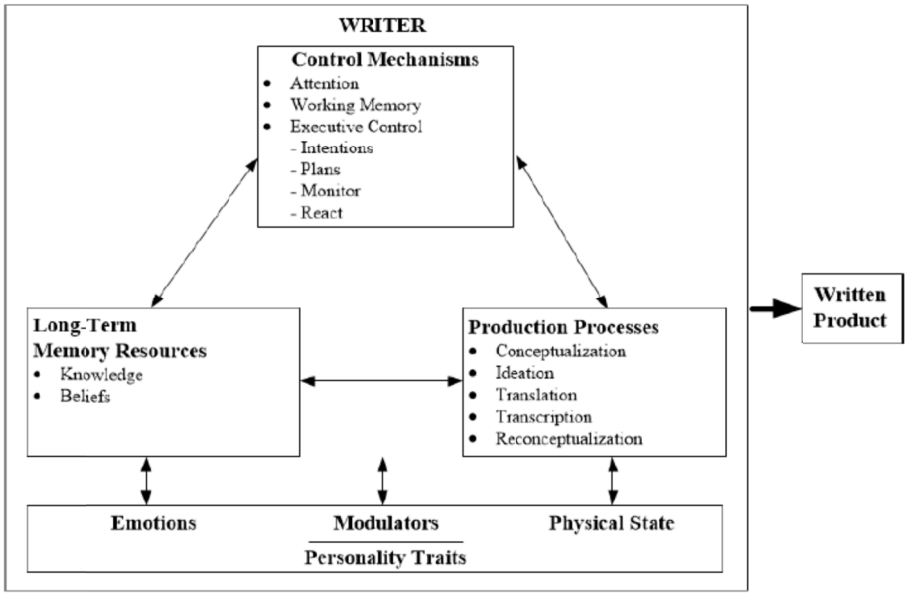

Figure 2: Cognitive Mechanisms Involved in Writing.

While the resources that a writer draws on can and often does reside within the writing community (e.g., source material), writing is also dependent on the richness of the *long-term memories resources* of those who produce it. A writer's memory holds beliefs about writing, including perceived value, utility, and interest in writing; expectations for writing success; and attributions for writing success or failure. It also includes one's beliefs about the value of different writing communities, the importance of writing within these communities, and one's assumed role, writing identity, and writing success in these contexts. The decision that writers make when composing are shaped by these beliefs, as they influence (among other things) whether one engages in writing, how much effort is committed, what cognitive resources and tools are applied, and how one interacts with other members of the community.

Long-term memory also holds the knowledge a writer has acquired that can be put into play when writing. This includes: acquired knowledge about language and literacy; specialized knowledge about writing (e.g., knowledge about spelling, sentence construction, text purposes and features, schema for composing); knowledge about the

writing topic, the presumed audience, and possible writing tools and resources; and knowledge about the writing purposes and practices of the communities in which one writes. What a writer does when writing is constrained by the depth and breadth of the knowledge that can be accessed from long-term memory. For example, richer pools of knowledge increase the chance a writer is able to meet his writing objectives and the purposes of the community for which the text is written.

Graham (2018) identified *five production processes* that a writer uses to create text. These production processes draw on knowledge held in long-term memory as well as resources in the community, as writers construct a mental representation of the writing task (conceptualization), gather ideas for the composition (ideation), take the most pertinent of these ideas and transforms them into acceptable sentences (translation), commit the sentences to paper or digital print (transcription), and engage in the act of revision (reconceptualization). Engagement and persistence in applying these production processes are influenced by some combination of a writer's personal beliefs about writing and the community in which it occurs. Cognitive overload and interference are less likely to occur, when writers have greater facility with the five production processes described above.

Graham (2018) further proposed that these production processes are initiated and coordinated through three basic *control mechanisms*: attention, working memory, and executive functioning. A writer also uses these control mechanisms to regulate the writing environment, writing tools, internal and external writing resources, motivational beliefs, emotional states, personality traits, physiological factors, and social interactions with collaborators, teachers, mentors, and audience within the writing community.

Attention allows a writer to choose where attention is or is not focused when writing. Working memory provides a limited and temporary storage system where information from memory and the environment are held and acted upon when composing. Executive functioning involves the processes of formulating intentions (setting goals), planning (initiating actions to achieve them, including drawing on a known schema for achieving intended goals, generating a new solution, or both), monitoring (evaluating goal process and impact), and reacting (modifying each of these as needed). These four executive functioning actions are applied to all aspects of writing including defining the writing assignment, developing a writing plan, gathering possible writing content, organizing it, constructing sentences, transcribing sentences into text, integrating visual and verbal features into text, reading and rereading plans and text for evaluative purposes, reformulating plans or text based on this evaluation, and editing and creating a polished final product. They are also used by the writer to manage emotions and dispositions, interactions with collaborators, use of selected writing tools, and arranging the writing environment.

Finally, all aspects of writing can be influenced (enabled or constrained) by *modulators* that involve the unique emotions, personality traits, and physical states of the writer (Graham, 2018). A writer who experiences writing anxiety (an emotional state), for instance, may judge his text more harshly than a student who is less anxious.

A learner who is conscientiousness (a personality trait) may be more likely to overcome low interest in writing a particular writing task than a less conscientious learner. A tired, hungry, stressed, or sick writer (physiological states) may have difficulty focusing attention when writing.

Other members of a writing community (collaborators, teachers, mentors, and readers) rely on these same cognitive components (*long-term memory resources, production processes, control mechanisms,* and *modulators*). For example, a reader applies control mechanisms to establish their purpose and plan for reading a writer's text, monitors their comprehension of it, and hopefully reacts to correct perceived misunderstandings. The readers draws on long-term memory resources, including knowledge of the writing topic and genre, to understand the text being read, and this whole process is likely colored by the emotional and physical state of the reader as well as her or his unique personality. If the reader provides the writer with feedback (moving into the role of a collaborator), then they must also engage the production processes of writing to conceptualize and create their response. Moreover, writing collaboration in any form (with peers, teachers, or mentors) requires that one's confederates apply their own control mechanisms to established shared or personal writing goals, access relevant beliefs and knowledge from long term-memory, and attend to the physical and physiological factors that might influence this collaboration. If the collaborators share in the production of plans or text, then they must also apply one or more of the five production process described earlier.

It is also important to note that teachers and mentors within a writing community also draw on specialized knowledge and beliefs about teaching writing. How writing is taught in a writing community depends on teachers or mentors' knowledge about effective writing instruction, the value placed on writing, and beliefs about one's capabilities to teach it (Brindle, Harris, Graham, & Hebert, 2016; Hsiang & Graham, 2016; De Smedt, Van Keer, & Merchie, 2016; Hsiang & Graham, 2016).

4. Design Principles Underlying PBPD and SRSD

In his model of writing, Graham (2018) argued that there are multiple mechanisms that promote writing development. This includes the collective influence of history, culture, politics, and institutions, and society on the communities within which writing takes placed; the impact of different writing communities on each other; changes within a specific writing community, as well as changes in the cognitive and affective properties of the members within said community. In the Harris et al. (2012a) study, there was not an attempt to influence broader macro forces such as history, culture, politics, and so forth, as this was well beyond the focus and power of this research team. Instead, they created a community of writing teachers, who were charged with making changes to the writing community that constituted their classroom, with the goal of creating cognitive and affective changes in both teachers and their students in terms of teaching writing and composing text, respectively. The remainder of this article specifies design

principles, focuses of instruction, and instructional activities for: (1) creation of a PBPD community, (2) changing the writing community in teachers' classrooms, (3) enhancing teachers' capabilities and motivation for teaching writing using SRSD, and (4) enhancing their students' capabilities and motivations for writing opinion essays. The basic aim of each design principle and the corresponding instructional focuses are drawn from Graham's (2018) model.

4.1 Creating the PBPD Community for Learning How to Implement SRSD

Table 1 presents the design principles for creating a PBPD community in which teachers were taught how to apply SRSD instruction in Harris et al. (2012a). This involved creating a community where teachers learned how to teach opinion writing to their students using SRSD within the context of a PBPD model (aim). To achieve this objective, instructional efforts applied by this research team focused on multiple aspects of a writing community (focus of instruction). These are described in Table 1 using the following components in Graham's (2018) writers in community model: purposes, members, tools, reoccurring actions, collective history, social and physical contexts. For each of these components of a writing community, Table 1 presents the instructional activities used to actualize it. Instructional activities include both teaching and learning activities.

Table 1. Design principles for creating the PBPD communities

Aim	Focus of Instruction	Instructional Activities
Create a PBPD Community Where Teachers Learn How to Teach Effectively Opinion Writing Using SRSD	PBPD Community Purposes	- Research team (RT) established the purposes of the PBPD community: collective participation of teachers in the same school with similar needs to learn how to implement SRSD instruction and improve their students' opinion essay writing. - RT established expectations for this purpose by describing what teachers can expect in terms of student gains, illustrating this with pre- and post-intervention writing samples from previous work in this area and findings from research. - Participating teachers discussed their writing program, goals for their students, and previous preparation to teach writing as well as their students' characteristics, strengths, and weaknesses for the purpose of determining how SRSD and PBPD can be adapted and implemented effectively in their classroom.
	PBPD Community Members	- Before the start of the study, RT determined membership of each PBPD community (i.e., teachers in the same school with similar instructional needs). - At the first PBPD meeting, RT and teachers established roles and responsibilities. Teachers are asked (and agreed) to be

		active, prepared, and contributing members of the PBPD community, providing each other and the RT with feedback and assistance while learning and implementing SRSD. Likewise, RT described how they would teach them to apply SRSD for opinion writing (using the stages of instruction in the SRSD model as well as provide feedback and assistance during initial learning and during SRSD implementation). - At the first PBPD meeting, teachers' identity as writing teachers and the value they placed on writing (including opinion writing) were explored, as teachers discussed their writing practices and prior experiences teaching writing. RT members shared their values and experiences teaching writing and SRSD. - During PBPD, teachers' norms for what constitutes good writing were expanded as examples of students' pre- and post-intervention writing samples were analyzed.
	PBPD Community Tools	- The RT used a variety of tools to teach SRSD during PBPD. These included two SRSD articles teachers read and discussed (providing the theoretical underpinning of SRSD, examples of this practice, and empirical findings), a video-tape showing SRSD instruction in vivo, and artifacts of students' work demonstrating possible student gains using SRSD. - Teachers were provided with detailed lesson plans, all accompanying teaching materials (e.g., transition word chart, genre parts card), and fidelity checklists to use when practicing SRSD during PBPD. These materials were used during classroom implementation too. - Teachers were provided with a pacing calendar they used to develop an initial plan for delivering SRSD instruction in their class.
	Reoccurring Actions in the PBPD Community	- RT described the basic approach that would be used to learn SRSD for opinion writing (teachers would be taught using the same stages of instruction as applied in SRSD). - RT described and modeled each stage of SRSD instruction. In turn, teachers practiced applying each stage of instruction with each other, receiving feedback and guidance from RT and other teachers. - Once teachers started applying SRSD instruction in their classroom, a member of RT provided on-going support, visiting their class every third day to observe instruction, provide feedback, and answer questions about instruction.

	Collective History for Building the PBPD Community	In designing PBPD communities, RT appropriated procedures applied in previous PBPD community construction efforts by the lead researchers and other researchers.
	PBPD Social Contexts	- During the first session, teachers and RT got to know each other better by sharing information about themselves and their students. - The PBPD sessions were highly interactive. Teachers asked questions, discussed and analyzed specific features of SRSD, practiced SRSD with each other, and provided feedback to the RT and their fellow teachers. - During implementation of SRSD in their classrooms, teachers were encouraged to seek feedback and support from RT and their fellow teachers. - Throughout PBPD, RT emphasized collaboration and working together.
	PBPD Physical Contexts	- Teachers met for two full days in a quiet room at their school to learn how to use SRSD. - On-going support during SRSD classroom implementation occurred in each teacher's classroom, but also included phone as well as email conversations.

Note. RT = research team.

The PBPD communities created in Harris et al. (2012a) were not created from scratch. Rather, they were constructed based on what they had learned in creating such communities in other studies (e.g., Harris et al., 2012b), and what had learned from others who have provided PBPD instruction to teachers in other academic domains (e.g., Ball & Cohen, 1999). These past experience provided a collective history that shaped how PBPD communities were designed in the study described in this article (see collective history, Table 1). While the research team made initial decisions about the purposes (e.g., learn how to implement SRSD for opinion writing), membership (e.g., teachers in the same school), tools (e.g., SRSD lesson plans), reoccurring actions (e.g., basic approach used to learn SRSD), and physical context of PBPD communities (e.g., quiet room at their school, with a research member visiting their classrooms periodically during instruction), teachers placed their individual stamp on each PBPD community created, as they collectively negotiated roles and responsibilities, examined their identities and expectations as writing teachers, discussed their students' strengths and needs, and explored how to deliver SRSD instruction in their class. Considerable emphasis was placed on collaboration within the PBPD community, with members helping each other and engaging in open and frank dialogue (e.g., social contexts).

While teachers and the research team spent 12 hours (6 hours a day) together in a room at the teachers' school learning how to apply SRSD for opinion writing with their students, their work was not bounded by this location or by time. For instance, they discussed their past and current experience teaching writing, identities as writing teachers, and goals for writing instruction. In addition, members of the research team became a member of each teacher's classroom, at least for a while, visiting a teachers' classroom every three days to provide support. In any event, each PBPD was driven by a central purpose: learning how to implement SRSD writing instruction for opinion essays so that it was effective, responsive to students' needs, and consistent with teachers' goals and values for writing instruction.

4.2 Reshaping Teachers' Classroom Writing Community to Incorporate SRSD Instruction

Table 2 describes the design principles for reshaping teachers' classroom writing communities in Harris et al. (2012a). This included creating a community in each teacher's class where opinion writing could be taught effectively using SRSD (aim). To achieve this goal, instructional efforts in this study concentrated on changing multiple aspects of teachers' classroom writing community (focus of instruction), again described using the components of a writing community as specified by Graham's (2018). Table 2 also presents the instructional activities applied to actualize these changes in the teachers' classroom writing community.

Table 2. Design principles for reshaping teachers' classroom writing communities

Aim	Focus of Instruction	Instructional Activities
Create a writing environment conducive to SRSD instruction for opinion essay writing	Community Purposes	- Teachers established new goals for writing instruction: students would learn to write opinion essays that were fun to read and write, made sense, persuades the reader, and had all its parts (topic sentence, three reasons, and conclusion). - Teachers described the instructional procedures they would use to achieve these goals. This included describing POW and TREE as well as the procedures used to teach them. - Teachers discussed with students how POW and TREE would help them meet the goals for writing fun and persuasive essays that included all parts. - Teachers established expectations with students for the types of essays they should be able to produce by examining and analyzing good opinion essays written by other children. - Students were asked to make a commitment (which they did) to learn the writing strategies.
	Community Members	- As SRSD instruction was provided by teachers, a RT member became a new (if temporary and periodic) member of each

		class, observing instruction and providing feedback and support to teachers every third day.
	Community Tools	Teachers introduced a variety of new tools into the classroom as they taught SRSD for opinion essay writing. This included model opinion essays (as well as poorly written opinion essays), a chart describing TREE and POW, a chart for transition words, a graphic organizer for planning and writing using TREE and POW, a self-instruction recording sheet, rocket graphing sheets where students recorded their writing performance, and individual folders where students stored these materials and opinion essays they wrote during instruction.
	Reoccurring Actions in the Community	- Teachers applied the six stages of SRSD instruction, introducing a new approach to teaching writing in their classroom. - As part of SRSD instruction, new reoccurring instructional actions were implemented, including peers working together as they planned and wrote compositions, students establishing goals for their compositions, and students monitoring their progress in writing.
	Community Collective History	Teachers appropriated procedures and routines from PBPD (created in large part in prior studies) to institute in their classrooms.
	Community Social Contexts	- At the start of SRSD instruction, students shared new information with their peers about how they wrote and managed the process of writing. - Teachers emphasized that they would apply a new approach to learning to write, as they would be working in partnership with each other and the teacher as they learned to write better opinion essays using SRSD.
	Community Physical Contexts	Teachers changed physical aspects of their classroom by creating and displaying posters that supported students learning. For example, one teacher used a poster that described POW and TREE as a memory aid. Another teacher put a poster of a tree without leaves on the classroom wall, and students added leaves with their self-statements on them.

Note. RT = research team.

Because SRSD instruction for opinion writing requires an extended amount of class time to implement (average of 24 classroom sessions in Harris et al., 2012a), and the instructional procedures applied by teachers often differ from their normal writing practices (this was the case in Harris et al., 2012a), an important goal is for teachers to

modify their classroom writing community so they can deliver SRSD instruction effectively and efficiently. The genesis for this change begins during PBPD, but extends into the classroom as teachers implement SRSD instruction, and receive support and feedback from a new, if temporary, member of their writing community (a research team member).

As can be seen in Table 2, changes in teachers' classrooms in the Harris et al. (2012a) study further included establishing new purposes for writing instruction (e.g., learn opinion writing) and students' writing (e.g., create opinion essays that are fun to read and write), introducing new tools for writing into the classroom (e.g., POW, TREE, and self-regulation procedures), establishing new routines for teaching writing (e.g., six stages of SRSD instruction), creating new social interactions (e.g., working in partnership with the teacher and peers to learn opinion writing with SRSD), and changing the physical nature of the classroom (e.g., displaying posters that facilitate the use of POW, TREE, or other aspects of instruction). All participating teachers in Harris et al. (2012a) introduced such changes into their writing classroom, but they did so in different ways in a number of instances (e.g., one teacher displayed a TREE on the wall where students could place leaves representing their self-statements). This individuality allowed teachers to adapt SRSD instruction to their personal approach to teaching and students' instructional needs.

4.3 Enhancing Teachers' Capabilities and Motivations to Teach Opinion Writing with SRSD

Table 3 presents the design principles Harris et al. (2012a) put into place to ensure participating teachers developed the skills and motivations needed to teach opinion writing via SRSD in their class. The specific aims of these efforts were to enhance multiple aspects of teachers' capabilities to deliver SRSD opinion writing instruction to their students in an efficient and effective manner. These aims center around the basic cognitive components described by Graham (2018), and included aims to enhance long-term memory resources for teaching writing via SRSD, apply writing production processes to personalize SRSD instruction, improve teachers' control of SRSD instruction, and address psychological factors (modulators) that may facilitate or hinder SRSD instruction. The focus of instruction for each of these aims is specified in Table 3, as are the instructional activities used to achieve them.

Table 3. Design principles for enhancing teachers' capabilities and motivations

Aim	Focus of Instruction	Instructional Activities
Enhancing Long-term Memory Resources for Teaching	Knowledge of 2nd and 3rd Grade Students' Writing Capabilities	- Teachers discussed their students' current writing performance, strengths, motivations, and needs during PBPD, providing a broader context for thinking about their students' writing capabilities. - During PBPD, teachers examined and discussed pre- and

Opinion Writing		post-SRSD intervention opinion essays written by students, providing knowledge about the types of gains that were possible. This was further extended as they examined and discussed gains made in two SRSD research studies. - At the start of SRSD instruction, students discussed with teachers their current approach to writing (which included self-regulation procedures such as planning, goal setting, self-monitoring, self-instructions, and self-reinforcement), providing teachers with a better sense of their students' writing. - As their students practiced applying POW & TREE (during classroom implementation), teachers had additional opportunities to form new, strengthen existing conceptualizations of 2nd or 3rd grade students' writing, or both, as they examined and discussed with their students what they wrote.
	Knowledge of Characteristics of Convincing Opinion Essays	- During PBPD, RT and teachers discussed the essential elements of opinion essays and general characteristics of good writing using the 6+ 1 trait model of writing. - As part of learning how to implement SRSD (during PBPD), teachers observed a RT member model how to analyze and discuss the characteristics of stronger and weaker opinion essays and then practiced doing this with another teacher, providing them with opportunities to form new knowledge about the characteristics of a convincing opinion essay. - Throughout PBPD, RT members probed for and confirmed teachers understanding of a convincing opinion essay, the resulting discussion provided additional opportunities for teachers' to refine their understandings. - As their students practiced applying POW & TREE (during classroom implementation), teachers had additional opportunities to form new, strengthen existing conceptualizations, or both, as they discussed with students (and in some instances helped them score) their essays.
	Knowledge of the Role of Self-Regulation in Writing	- During PBPD, RT and teachers discussed why self-regulation (including planning, goals setting, self-monitoring, and self-instructions) procedures were important to students' writing success. - As students practiced applying POW, TREE, and the self-regulation procedures taught (e.g., goal setting, self-monitoring, self-instructions, self-reinforcement) during classroom implementation), teachers had additional

		opportunities to form new, strengthen existing conceptualizations of self-regulation and writing, or both, as they had direct opportunities to see the impact of such procedures.
	Knowledge of the Role of Effort and Motivation in Writing	- During PBPD, RT and teachers discussed the role of student effort and motivation in instruction and students' writing, with a particular emphasis on effort. - As students practiced applying POW, TREE, and the self-regulation procedures taught, teachers had additional opportunities to form new, strengthen existing conceptualizations of motivation and effort in writing, or both, as they talked and listened to their students talk about writing or observed their reactions.
	Knowledge of SRSD Instruction	- At the start of PBPD, teachers discussed their current approaches to writing instruction and the process writing model; RT helped them draw connections between these approaches and SRSD, emphasizing where they were consistent, such as the use of peer support. - RT shared with teachers how SRSD had worked for them when teaching writing, but also made it clear that SRSD is not a full writing program, establishing boundaries for what it can and cannot do. - During PBPD, multiple avenues were pursued to increase teachers' knowledge and understanding of SRSD instruction, including how to apply it to improve young writers' opinion essay writing. This included (1) reading and discussing articles that shared the theoretical basis for SRSD, examples of it in application, and its quantitative impact on the quality of students' writing; (2) watching and discussing a video where teachers delivered SRSD instruction; (3) reading, analyzing, and discussing detailed lesson plans for teaching opinion writing via SRSD; (4) observing a RT member model each component of SRSD; (5) teachers creating their own shortened version of an SRSD lesson before practicing it with a peer; (6) participating as a learner as another teacher implemented an SRSD lesson; (7) receiving feedback and listening to feedback that others received as they practiced SRSD lessons; and (8) collecting and discussing the treatment fidelity information collected as they implemented SRSD in their classroom. - Throughout PBPD, RT members probed for and confirmed teachers understanding of using SRSD to teach opinion essay

		writing and teachers were encouraged to ask clarifying questions or share observations, providing additional opportunities for teachers' to refine their understandings. - As SRSD was taught in the classroom, teachers had additional opportunities to form new, strengthen existing conceptualizations of SRSD, or both, as they applied it, observed their students' performance and reactions to it, discussed it with them, and monitored the fidelity with which they implemented it. - The on-going classroom support provided by RT during classroom implementation, provided further opportunities to learn more about SRSD instruction, as teachers were provided with extra feedback and support (as needed) on how to apply SRSD effectively. - During PBPD, teachers discussed how to support maintenance and generalization of strategy use. This included how to help students identify places where they could use what they were taught as well as developing instructional plans for promoting this.
	Beliefs about the Value of Teaching Opinion Writing to Young Students	- At the start of PBPD, RT and teachers discuss why students' need to learn to write convincing opinion essays. This discussion extended beyond the State or school standards to include why opinion writing is important more generally. - During SRSD instruction, teacher and students discussed the value of opinion writing, providing teachers opportunities to refine their beliefs on this topic.
	Beliefs about the Value of SRSD Instruction	- During PBPD, teachers were provided with concrete examples of the effects of SRSD instruction. This included information about the effects of SRSD instruction in multiple research studies and concrete examples of SRSD effectiveness illustrated in students' pre- and post-instructional writing. - During instruction, teachers had opportunities to observe student growth in writing through their own reading of students' essays and through students' evaluation and graphing of their writing performance.
	Beliefs about One's Competence to Teach Opinion Writing to Primary Grade	- During PBPD, teachers had the opportunity to apply each lesson after first discussing it as a group, observing the RT model the lesson, asking questions about the model, and delivering it themselves in a supportive environment (mastery experiences such as these enhance self-efficacy) - During SRSD instruction, teachers received on-going

	Students	support from RT, which was designed to increase the likelihood of a positive mastery experience.
	Beliefs about Identity as a Writing Teacher	Participation in the PBPD community provided teachers with the opportunities to view themselves as writing teachers, interact with other writing teachers, and potentially form new impressions of their identities as a writing teacher.
Engage Writing Production Processes to Personalize SRSD Lessons	Reconceptualization, Translation, and Transcription of SRSD Lesson Plans	Teachers were asked to reconceptualize each lesson plan before practicing it in PBPD. This involved personalizing the wording in each lesson, reducing the amount of elaboration, and modifying each lesson so they were responsive to students' needs and the teacher's approach to teaching writing. Each reconceptualization was translated and transcribed into writing by the teacher so that it was available when they practiced the lesson in PBPD and implemented it during classroom instruction.
Facilitating Teachers' Control of SRSD Instruction	Attention	- During PBPD, teachers examined and discussed written examples, video examples, detailed lesson plans, and live-models of SRSD instruction, providing them with schemas for where and how to focus their attention during SRSD instruction. - During PBPD, teachers considered and discussed how to differentiate instruction, making this a focal point for teachers' attention when providing SRSD instruction. - When teaching SRSD in the classroom, teachers checked each step of the lesson as it was completed. This helped to ensure that they attended to all steps within a lesson.
	Working Memory	- During PBPD, observing SRSD instruction, reconceptualizing SRSD lesson plans through discussion and writing, and practicing each lesson made SRSD instruction more familiar and concrete as well as more effortless for teachers to implement. This made it more likely that teachers would have access to cognitive resources to attend to other and even unexpected issues as they arose during classroom instruction or as they tried to differentiate instruction on the spot (in effect, bringing into play new goals, plans, evaluations, and reactions to address these issues).
	Executive Functioning	- The SRSD instructional procedures teachers were taught to implement during PBPD provided them with goals for writing instruction and a schema or plan for how to teach POW, TREE, and the targeted self-regulation procedures. - During PBPD, teachers personalized this instructional schema so that it was relevant for their students and class.

		- When implementing this SRSD instructional schema in their class, the fidelity checklist teachers completed reinforced the use of the schema taught during PBPD as did the on-going feedback by the RT member in the classroom who observed them every three days. - Students' graphing of their on-going writing progress on the rocket chart provided teachers with feedback on the success of SRSD instruction as did ongoing feedback from the RT every three days, providing teachers with data for modifying instruction as needed.
Addressing Psychological Factors that May Influence Teaching	Increase Enthusiasm for Teaching SRSD for Opinion Writing	- During PBPD, RT shared concrete written examples of the substantial improvement SRSD can produce in students' writing. - During PBPD, RT created a positive learning environment where each teacher received support as well as constructive and positive feedback for all members of the community. - When teaching SRSD in their classrooms, children graphed their performance on the rocket charts, providing teachers with evidence of the positive impact of SRSD. - Teachers monitored SRSD implementation in the classroom, providing them with evidence of their success in putting this approach into play. - The on-going classroom support provided by RT during classroom SRSD instruction provided needed assistance as well as constructive and positive feedback.

A basic assumption underlying PBPD is teachers will be more adept and effective at applying new approaches to teaching when they acquire the content and pedagogical knowledge needed to implement the practice (Ball & Cohen, 1999). It is also likely that teachers' effectiveness to apply new instructional approaches increases when they form more positive beliefs about what they are teaching and their capabilities to teach it, as they are more likely to engage confidently in such instruction and persist at it. As can be seen in Table 3, PBPD, on-going classroom support, and lessons learned by teachers while implementing SRSD in their classroom were designed to expand teachers' knowledge about (1) students' writing capabilities in second and third grade; (2) the characteristics of convincing opinion essays; (3) the role of self-regulation, effort, and motivation in writing; and (4) how to implement SRSD instruction. These procedures also included instructional activities for enhancing teachers' beliefs about the value of opinion writing and SRSD instruction, their competence to teach writing, and their identity as a writing teacher. In essence, these instructional activities were designed to

strengthen teachers' long-term memory resources for teaching opinion writing via SRSD.

Instructional activities included in PBPD, on-going classroom support, and lessons learned by teachers during SRSD implementation were also designed to facilitate teachers' control of SRSD instruction as well as increasing teachers' enthusiasm to apply this method in their classroom. this included providing schemas and mechanisms for focusing attention during SRSD instruction (e.g., lesson checklists suggestions for how to differentiate instruction), reducing strain on working memory while teaching (e.g., applying a model of instruction where teachers practiced applying the same SRSD materials and instruction before applying them in their class), and facilitating executive functioning (e.g., instructional goals for SRSD instruction were actualized). Instructional activities for increasing enthusiasm ranged from making clear possible and actualized gains from SRSD to creating a positive and supportive PBPD environment where teachers were supported as they learned and then implemented SRSD.

It is important to note that Harris et al. (2012a) applied a variety of different instructional activities to meet the various aims and instructional focuses identified in Table 3. This included, but was not limited to, discussing students' writing characteristics and teachers' instructional goals so that SRSD instruction could be better matched to classroom realities, examining and discussing video and written examples of SRSD instruction (including lesson plans for SRSD opinion writing), observing a research team member model SRSD lessons, personalizing each lesson as teachers reconceptualized it through writing, practicing how to deliver each lesson, and receiving feedback on implementing SRSD during PBPD and in the classroom. Instructional activities designed to enhance teachers' capabilities and motivations to teach SRSD opinion writing were not only varied, but specific instructional activities addressed more than a single focus of instruction. For instance, when delivering SRSD in the classroom, students analyzed, graphed, and discussed their performance on each essay produced. This instructional activity potentially increased teachers' knowledge of students' writing capabilities and characteristics of convincing essays, beliefs about the value of SRSD instruction, and enthusiasm for teaching opinion writing using SRSD.

4.4 Enhancing Students' Capabilities and Motivations to Write Opinion Essays

The design principles for SRSD instruction in the Harris et al. (2012a) study are presented in Table 4. The purpose of this instruction was to enhance students' capabilities and motivations to write stronger opinion essays. The specific aims of this SRSD instruction were to enhance students' long-term memory resources for writing opinion essays, improve students use of writing production processes when composing opinion essays, provide students with greater cognitive control over the writing strategies and self-regulation procedures taught as part of SRSD instruction, and address psychological factors (modulators) that may facilitate or hinder students' writing of

opinion essays. The focus of instruction for each of these aims is also presented in Table 4, as are the instructional activities used to achieve them.

Table 4. Design principles for enhancing students' capabilities and motivations

Aim	Focus of Instruction	Instructional Activities
Enhancing Students' Long-term Memory Resources for Opinion Writing	Knowledge of How One Writes	- During Discuss It, students shared and discussed their current approach to writing, which included how they regulated the process of writing (e.g., set goals, monitored their writing, what they said to themselves) and their attitudes and beliefs about writing, providing them with an opportunity to define and even create a new picture of how they wrote. This discussion also provided a broader context for thinking about their writing in relation to the writing of their peers. - Starting in Develop Background Knowledge and extending into later stages of instruction, students examined models of good and poor opinion essays, providing additional evaluative criteria for thinking about their own writing. - Starting during Model It and extending to Independent Performance (as student learned to apply POW, TREE, and the target self-regulation procedures), they evaluated and graphed their performance of completed opinion essays, allowing them to observe growth in writing performance over time. These evaluations provided a mechanism for creating new accounts of their current writing and approaches to writing. - As students practiced applying POW, TREE, and the self-regulation procedures during Support It and Independent Performance, the teacher held conferences with them discussing the text they created. This provided students with opportunities to gain new insights into their writing.
	Knowledge of the Characteristics of Convincing Opinion Essays	- During Develop Background Knowledge, the TREE strategy was introduced, and each part of an opinion essay represented by this mnemonic were described and discussed. - At the same time, types of vocabulary, such as fact versus opinion and transition words, important to writing a convincing essay were introduced and discussed. - During Develop Background Knowledge and Discuss It, students and teacher read and analyzed model opinion essays to identify the features of a convincing argument; this included focusing on the part of a good opinion essay as exemplified in TREE as well as the different types of vocabulary pertinent to a convincing opinion essay. As they did this, students completed

	a graphic organizer (the same one they would use for planning later essays) to record each of the basic parts of the model essay as well as the transition words the author used. Writing their responses onto the graphic organizer provided a tool for enhancing students' memory of these characteristics. - After reading model essays, students and teacher read and analyzed weak opinion essays and considered what needed to be changed to make them stronger. This provided students with additional opportunities to extend and apply their developing knowledge of the parts and characteristics of a convincing essay. - Throughout SRSD instruction, teachers probed for and confirmed students' understanding of convincing opinion essays. The resulting discussion provided opportunities for students' to refine their understandings. - As students observed the teacher model (Model It) and they themselves practiced applying POW, TREE, and the self-regulation procedures (Support It and Independent Performance), students had additional opportunities to form new, strengthen existing conceptualizations of a convincing essay, or both, as they discussed these essays and evaluated and graphed their performance on the graphic organizer.
Knowledge of the Role of Self-Regulation in Writing	- During Discuss It and continuing into Model It, teachers described and discussed with students four self-regulation procedures (goal-setting, self-monitoring, self-instructions, and self-reinforcement). This was designed to increase students' knowledge of these self-regulation strategies and their role in writing. - During Discuss It, the teacher established with students the overall goals for the essays they would write during instruction and beyond (fun to read, fun to write, makes sense, has all of its parts, and persuades the reader). Students were asked to make a commitment to learn the target strategies and work in partnership with the teacher, making the process of goal setting a concrete aspect of the learning process right from the start of instruction. - Throughout SRSD instruction, teachers probed for and confirmed students' understanding of self-regulation (including how POW and TREE regulated students' writing), providing students with additional opportunities to refine their understandings. - As the teacher modeled writing an opinion essay (Model It),

		goals were set (create an opinion essay that is fun to read, fun to write, makes sense, has all of its parts, persuades the reader), POW and TREE were applied, and the number of parts and transitions words used in the completed essay were identified and graphed. Teachers discussed with students the role of these self-regulation procedures in the text produced. The model provided by the teacher and the subsequent discussion, provided students with an opportunity to increase their understanding of the role of goal-setting, POW and TREE, and self-monitoring and graphing when writing. - During Model It, the teacher used a variety of self-instructions (e.g., goal setting, problem solving, self-evaluation, self-reinforcement, and coping statements) to regulate the process of writing an opinion essay. Once the essay was completed, teacher and students discussed what the teacher said. Students then devised their own self-statements to apply when writing, expanding their thinking on how this particular aspect of self-regulation influences writing. - As students applied self-regulation procedures when they wrote opinion essays, they had additional opportunities to form new, strengthen existing conceptualizations of their knowledge about self-regulation and writing, or both. - As students practiced writing opinion essays using the target self-regulation procedures during Support It and Independent Performance, the teacher held conferences with them where students were asked how the self-regulation procedures including POW and TREE, helped them as they wrote, strengthening student' conceptualization of how writing performance is related to process.
	Knowledge of the Role of Effort and Motivation in Writing	- During Discuss It, students shared and discussed their current approach to writing. This included their attitudes and beliefs about writing, providing students with the opportunity to consider the role of motivation in their own writing. This discussion also provided a broader context for other students to think about how motivation influenced the writing of their peers. - During the Develop Background Knowledge and Discuss It, the teacher stressed the importance of effort when writing a strong opinion essay. - As the teacher modeled writing an opinion essay (Model It), the role of effort was emphasized and the teacher made positive motivational self-statements while writing. These and other self-

		statements were discussed after the teacher was done modeling, and some students elected to develop motivationally related self-statements they would use when they wrote their own essays (Support It and Independent Performance). - As students practiced writing opinion essays (Support It and Independent Performance), the teacher held conferences with and emphasized the role of effort in students' continuing writing progress, providing them with direct observations of how effort enhanced their writing performance.
	Knowledge of How SRSD Instruction Can Impact One's Opinion Writing	- During Develop Background Knowledge and Discuss It, students analyzed strong and weak opinion essays and discussed the characteristics of such compositions. This provided students with a framework against which to compare their own writing performance in later stages of instruction. - Starting with Model It (where the teacher modeled how to use the target instructional procedures) and continuing on through Independent Performance (where students practiced applying these procedures), students monitored their progress writing opinion essays by recording if they met the goal to include a topic sentence, at least three reasons to support it, a conclusion, and transition words on a rocket chart. This provided students with a direct and visible evidence of the impact of SRSD.
	Knowledge of When and Where to Use Taught Strategies	- During Discuss It, teachers discussed with students when and where POW and TREE could be used. As self-regulation procedures were introduced, they also discussed when and where they could be used. This discussion also focused on identifying situations in which using the procedures were not appropriate (e.g., TREE for writing a story). - Across Model It to Independent Performance, teachers and students developed plans for applying what they had learned to situations outside of the classroom. This included identifying appropriate places to apply learned skills, considering how procedures would need to be adapted, and encouraging students to try these procedures in these new venues.
	Knowledge of Changes in the Classroom Writing Community	- During Develop Background Knowledge and Discuss It, the teacher described their plan to teach opinion writing, the strategies to be taught and their purpose, and how they were to be taught (including working together to achieve the goal of enhancing students' opinion writing). This signaled how the classroom writing community would operate in the near future. - The teacher also informed students that a RT member would be observing and providing the teacher with some support as

		they learned to write opinion essays.
	Beliefs about the Value and Utility of Opinion Writing	- During Develop Background Knowledge and Discuss It, the teacher discussed with students the purpose of opinion writing, emphasizing why it is important and useful. Together they identified when and where it was important to use this type of writing. - Throughout SRSD instruction, teachers were encouraged to take advantage of teachable moments where they could further emphasize the value and utility of opinion writing.
	Beliefs about Why One Writes Opinion Essays	During SRSD instruction, the teacher emphasized that by gaining mastery over writing an opinion essay, students would be able to use this type of writing to make valid arguments for what they wanted.
	Beliefs about One's Competence to Write Opinion Essays	- SRSD instruction was structured so that students would be successful when writing opinion essays. It taught students' needed skills (knowledge as well as strategies and self-regulation procedures for writing a convincing opinion essay), and it applied a gradual release model where teachers first demonstrated how to apply these procedures (Model It), but increasingly removed instructional supports (e.g., the use of the POW and TREE graphic organizer) until students could apply these procedures successfully on their own (Independent Performance). Mastery experiences such as these enhance self-efficacy. - Throughout the application of this gradual release model, students' graphed their performance and discussed their success. This provided them with evidence of their progress, which should lead to a greater sense of efficacy to write opinion essays.
	Beliefs about Why One is Successful When Writing Opinion Essays	- During the Develop Background Knowledge and Discuss It, the teacher stressed the importance of effort and using TREE, POW, and the self-regulation procedures. As the teacher modeled writing an opinion essay (Model It), the role of effort and strategy use was again emphasized. As students practiced writing opinion essays (Support It and Independent Performance), the role of effort and strategy use was emphasized as the reasons for students' continuing writing progress. Emphasis on effort and strategy use provided an alternate explanation to success/failure than ability or luck.
	Beliefs about One's Identity as a Writer	Throughout SRSD instruction, the teacher emphasized that all students in the class could learn to write good opinion essays. Students also graphed their progress (which showed gains in

		opinion writing). These instructional procedures provided mechanisms for students to develop a positive belief about their identity as a writer.
	Beliefs about One's Writing Classroom	- To facilitate positive beliefs about the writing classroom, the teacher established at the start of SRSD instruction (Develop Background Knowledge and Discuss It), clear instructional goals (to learn to write opinion essays that are fun to read and write, make sense, have all the parts, and persuades the reader), described how these goals would be achieved, and encouraged students to work in partnership with the teacher to achieve them. - Efforts to create positive beliefs about the writing classroom were supported by teachers' actions, as teachers were encouraged to deliver SRSD instruction as they described it to students with fidelity.
Improving Students' Writing Production Processes	Conceptualization	- Students were taught planning strategies as embodied in POW and TREE designed to help them conceptualize a plan for creating an opinion essay. - During Model It, students observed how the teacher set goals for writing (e.g., write an essay that is fun to read and write) and how the POW and TREE plan was created (while providing active participation in creating this plan), making the conceptualization process more concrete. - During Model It and Support It, students were temporarily provided with supports for carrying out the conceptualization process. These included teacher and peer support, charts describing POW and TREE, a graphic organizer for creating planning notes, and a chart listing personalized self-statements (some of these statements addressed conceptualization). - During Support It and Independence Performance, students practiced the process of conceptualizing plans for opinion essays, increasing their facility in doing so.
	Ideation	- POW and TREE supported ideation, as POW prompted students to Pick ideas in advance of writing, Organize notes using TREE (i.e., generate possible ideas to use based on the structural elements), and Write and say more (generate additional ideas while writing). - During Model It, students observed how POW and TREE supported the ideation process, including the use of brainstorming as a means for generating ideas, making the ideation process more concrete. - During Model It and Support It, students were temporarily

		provided with supports for carrying out the ideation process. This included teacher and peer support, charts describing POW and TREE, a graphic organizer where ideas were recorded. - During Support It and Independence Performance, students practiced the process of ideation with POW and TREE, increasing their facility using them for this purpose.
	Translation	- The third step of POW, Write and say more, prompted students to translate the plan they created on the graphic organizer or blank piece of paper (as they move towards Independent Performance) into written text. - During Model It, students observed how a writing plan was translated to written text, making the translation process more concrete. - During Model It and Support It, students were temporarily provided with supports for translating their writing plan into text. This included teacher and peer support, a transition word list, and a chart listing personalized self-statements (some of these self-statements addressed translation). - During Support It and Independence Performance, students practiced the process of translating writing plans into text, increasing their facility in doing so. - From Model It to Independent Performance, students set goals to include a topic sentence, three or more reasons, a conclusion, and transition words in their essays and monitored and graph if they met these goals. This provided students with information on their success in executing the translation process as specified with POW and TREE.
	Reconceptualization	- The third step of POW, Write and say more, also prompted students to reconceptualize their writing plan, as they were encouraged to think about and modify their initial plan as needed while writing. - During Model It, students observed the teacher (1) modify their initial plan while creating it and (2) continue to modify it as they write. This made the process of reconceptualization more concrete. - During Model It and Support It, students were temporarily provided with supports for reconceptualizing a plan when initially creating it and later when revising it while writing. This included teacher and peer support, a chart listing the POW steps, and personalized self-statements (some of these statements addressed reconceptualization). - During Support It and Independence Performance, students

		practiced reconceptualizing their writing plans at the initial point of creation and when writing, increasing their facility in doing this.
Facilitating Students' Control of POW, TREE, and the Self-regulation Procedures	Attention	- POW and the chart depicting it were designed to provide explicit focus on what activities students do (attentional focus) and provided clearly defined markers for what to do next (shifting attention) when writing an opinion essay. - TREE and the chart depicting it, the transition word chart, and the monitoring and graphing rocket procedures focused students' attention on writing opinion essays that included a topic sentence, three of more reasons, a conclusion, and transition words (promoting both attentional focus and shifting). - Analysis of good and poor opinion essays during Develop Background Knowledge and Discuss It, reinforced students focusing their attention on the basic structural elements of an opinion essay and the use of transitions words, but the discussion surrounding these essay was open-ended enough so that other aspects of good writing became a focal point as well (e.g., an opening that catches the readers' attention). - During Discuss It, students made a commitment to learn the target strategies, and they also set goals for their opinion essays (with some students developing individualized goals later). Goals increase persistence (maintain attention). - The self-statements students' developed after watching the teacher model writing an opinion essay (Model It) mostly directed students attention to engaging in specific activities ("Use POW") and maintaining focus (e.g., "Keep going"). - During Model It, the teacher modeled while talking aloud how to use POW, TREE, and the self-regulation procedures. The teachers' vocalization and actions provided students with a model of where to focus attention as well as how to shift and maintain attention. During Support It and Independent Performance, students' use of these behaviors were reinforced as they practiced applying them.
	Working Memory	- To reduce the cognitive load of writing on working memory, writing was divided into two smaller tasks. Planning in advance of writing and using the plan created as guide to writing. Students were encouraged to continue planning while writing, but the majority of the planning process was separated from drafting the actual essay. - Students cannot hold ideas in working memory indefinitely, so students wrote their advanced writing plans on a graphic

		organizer (and later on a piece of plain paper), so that they would be more permanent and easily accessible. - Students were provided with mnemonics (e.g., TREE) to make strategy steps more accessible. A visual representation of TREE was also provided to make it easier for students to remember what each letter represented (e.g., the topic sentence is like the trunk of the tree – everything is connected to it). Other information was also provided visually, such as a transition word chart and self- statement charts, providing a memory aid, until they were no longer needed. - To make POW and TREE even more readily accessible to working memory, students memorized the steps for each mnemonic and their purpose (Memorize It). - The POW, TREE, and the self-regulation procedures require considerable effort to execute. To reduce cognitive load on working memory, students practiced using them (Model It through Independent Practice) until they could do so easily and correctly.
	Executive Functioning	- The knowledge that students acquired about the characteristics of convincing opinion essays by analyzing strong and weaker essays and discussing their attributes (Develop Background Knowledge and Discuss It) as well as by analyzing their teacher's writing (Model It) and their own writing (Support It and Independent Performance) provided them with schemas for opinion writing. - The goals for writing (e.g., write essays that are persuasive, fun to read and write, and contain all of the parts) established during Discuss It, provided a schemas for what students' essays should accomplish. - POW, TREE, and the self-regulation procedures provided schemas for accomplishing the product goals set by the classroom teachers. They further served as guides for directing students' planning, action, monitoring, and reaction when writing opinion essays. - Students learned to apply these schemas in an efficient and organized manner, through modeling (Model It) and supported practice (Support It). - To respond to individual differences in students' writing, some students met individually with the teacher to establish additional and challenging writing goals involving genre elements (e.g., provide additional elaboration for each reason) or the characteristics of good writing (e.g., vary sentence use).

		- The last step of the POW strategy, Write and say more, provided a mechanism to prompt students to continue to monitor their initial plan and text produced so far to determine how to modify them in relation to their initial goals and any new goals that were established as part of this process. - Monitoring and graphing performance (i.e., essay parts and transition words) provided students' with information on goal attainments (as did teacher and peer feedback), allowing students an opportunity to change their paper or modify their future writing behavior. - Flexible adaptation of the schemas that students learned to use was promoted by having students identify new situations in which to apply these procedures, discuss how they would need to be adapted, and encourage students to apply them beyond the classroom (this started during Discuss It).
Addressing Psychological Factors that May Influence Students' Writing	Increase Enthusiasm for Writing Opinion Writing	- Throughout SRSD instruction, teachers were encouraged to be a positive and enthusiastic model, emphasizing the joy of writing, the value and importance of opinion essay writing, and celebrating students' successes and progress as writers. - With SRSD instruction, students were taught the skills needed for success and the stages of SRSD instruction were designed to ensure student mastery of opinion writing, increasing the likelihood of student enthusiasm. - During Discuss It, students were told that they would all work together during SRSD instruction. Students helped the teacher (Model It) and each other (Support It), providing the opportunity for a greater communal enthusiasm for opinion writing. - During Develop Background Knowledge and Discuss It, the teacher and students discussed why opinion writing was beneficial to them. - From Model it to Independent Performance, students monitored and graphed their performance on the rocket charts, providing students with evidence that there opinion writing was improving. This should promote greater enthusiasm for opinion writing.
	Address Personality Traits	- During Model It, teachers used self-instructions to address personality traits, such as impulsivity ("Take my time.") or frustration ("This is hard, but I can do it."). - Following modeling, the teacher and students discussed what the teacher said while planning and writing. This included how some of the teacher's statements helped address things that get in a writer's way, such as frustrations, negative talk, and so

	forth. Some students generated self-statements that they could use when planning and drafting to help them with such problems. The teacher took an active role in this privately encouraging some students to address specific personality traits. - From Model It to Independent Performance, students were encouraged to apply their self-statements when planning/writing. This provided a means to address specific personality traits for students who generated pertinent self-statements.

The SRSD instruction provided by teachers in the Harris et al. (2012a) study sought to make students better opinion writers by enlarging their knowledge about (1) their own writing; (2) characteristics of a convincing essay; (3) role of self-regulation, motivation, and effort in writing; (4) effects of SRSD on opinion writing; (5) when and where to use POW, TREE, and the self-regulation strategies; and (6) planned changes in the classroom to accommodate SRSD instruction. The instructional activities for achieving these focuses of instruction were designed to strengthen the long-term memory resources students could bring to bear when writing opinion essays and using the inculcated strategies taught via SRSD.

Additionally, SRSD instruction in Harris et al. (2012a) was designed to promote a variety of positive beliefs that students could draw on from their long-term memory as they wrote opinion essays and applied POW, TREE, and the taught self-regulation strategies. This included beliefs about the value and utility of opinion writing, competence as a writer of opinion essays, the factors that lead to success when writing such papers (e.g., effort and strategy use), identity as a writer, and the writing community (e.g., emphasizing a partnership between students and teachers).

As can be seen in Table 4, SRSD instruction in Harris et al. (2012) was designed to improve multiple writing production processes. This included using POW and TREE to conceptualize an opinion essay on a specific topic, generate possible ideas for it, translate it into a plan and subsequently text, as well as reconceptualizing plan and text using POW and TREE.

Instruction was further constructed to provide students with greater control over the process of writing opinion essays, as the strategies (POW and TREE), self-regulation procedures (e.g., goal setting, self-monitoring, self-instructions), analysis of model essays, and the rich discussions that occurred provided schemas and mechanisms to help students (1) focus their attention during instruction (e.g., commitment to learn the target strategies) and when writing opinion essays (e.g., establishing the characteristics of a good opinion essay), (2) reduce the strain on working memory of using effortful and newly acquired writing strategies (e.g., memorization of the steps in TREE and POW, separating writing into planning and generating text, supported practice applying strategies until they can be applied effectively and independently), and (3) facilitate

executive functioning (e.g., set goals for writing, POW and TREE schema for planning and writing opinion essays).

Finally, SRSD instruction in Harris et al. (2012a) included activities aimed at addressing specific modulators described in the Graham (2018) writers in community model. This involved promoting positive student emotions for writing opinion essays (e.g., student growth as writers was made evident; teachers were enthusiastic and positive about this type of writing). It also included addressing individual student behaviors or traits (e.g., impulsivity) that might impede student success when writing or using the strategies taught, as students individually devised and were encouraged to apply self-instructions they designed specifically for this purpose.

As was the case for advancing teachers' competence and motivations to teach SRSD for opinion writing, a variety of different instructional activities were used to advance students' knowledge and motivations to write better opinion essays via SRSD instruction. Likewise, in many instances, a specific instructional activity for advancing student competence addressed more than a single focus of instruction. For example, teacher modeling of how to use POW, TREE, and the self-regulation strategies addressed goals for increasing students' knowledge about writing opinion essays (as teachers emphasized the role of effort when modeling how to write an opinion essay), creating positive beliefs about one's competence as an opinion writer (as students helped the teacher generate an convincing essay during modeling), improving writing production processes (as students help the teacher generate ideas for the opinion essay produced during modeling), facilitating cognitive control (as teachers self-talk during modeling provided students with an initial framework for where to focus attention and how to shift it when writing an opinion essay), and addressing modulators that may enhance or impeded writing (as teachers used self-talk during modeling that showed students positive ways of addressing challenging behaviors such as frustration).

Equally important, some instructional activities facilitated both student and teacher development. Take for instance, the instructional activity involving students' analysis and graphing of their writing performance. As noted earlier, the inclusion of this single instructional activity in SRSD was intended to increase teachers' knowledge of their students' writing capabilities and characteristics of convincing essays, beliefs about the value of SRSD instruction, and enthusiasm for teaching opinion writing using SRSD (see Table 3). This same instructional activity was similarly expected to increase students' knowledge and beliefs (knowledge about their own writing and the characteristics of convincing essays as well as the value and impact of SRSD instruction), and increase students' enthusiasm for writing opinion essays (see Table 4).

5. Conclusions

This article specified the instructional design principles underlying a single research application of SRSD instruction with second and third grade students, including the professional development procedures (PBPD) used to teach it to these students' teachers

(Harris et al., 2012). We applied Graham's (2018) writers in community model to identify the theoretical aims, instructional focuses, and corresponding instructional activities for the four major objectives in this study: (1) create a PBPD community to help participating teachers learn to effectively apply SRSD for opinion writing in their classroom, (2) provide teachers with direction to help them reshape their writing classroom community so that it is conducive to SRSD instruction, (3) enhance participating teachers' capabilities and motivations to use SRSD to teach opinion writing in their classroom, and (4) improve students' cognitive capabilities and motivations to write opinion essays using two POW and TREE.

The PBPD for teachers and the resulting SRSD for students served overlapping purposes, as they were designed to provide teachers with the tools, knowledge, and dispositions to teach their students to write effective opinion essays and students with the tools, knowledge, and dispositions to write such essays (see also Koster & Bouwer, 2018 this issue). Both PBPD and SRSD applied similar instructional procedures to accomplish each of these goals, including explanation, rich discussion, models, modeling, practice, gradual release, and feedback. This meant that teachers were taught to apply the SRSD model in much the same way that students were taught to apply POW, TREE, and the various self-regulation procedures. For both forms of instruction, there was also an emphasis on how to apply flexibly and effectively what was learned in both the classroom for teachers and students and outside it for students. Further, PBPD was designed to provide teachers with the knowledge, dispositions, executive and psychological control to shape their classroom and apply SRSD instruction so that it was effective, whereas the SRSD instruction students received were designed to shape these same cognitive resources and capabilities with the addition of enhancing their writing production processes. This overlap in aims and teaching procedures is deliberate as teachers are likely to teach as they have been taught (Darling-Hammond & Bransford, 2005).

It is important to note that this is a retrospective analysis of the instruction provided in the Harris et al. (2012a) study, and we applied a new lens for specifying the design principles underlying it. In doing so, we used Graham's (2018) model to identify the components of a writing community that were addressed as Harris and colleagues created PBPD communities and helped teachers reshape their classroom writing community. Likewise, we specified the basic cognitive capabilities of teachers and students that instruction (PBPD and SRSD) was designed to change. While the Graham (2018) model did not drive the instructional design principles when Harris and colleagues did their study (this model did not exist in 2012), it was not dissimilar from our thinking at the time, and it provides a more nuanced model for specifying the theoretical instructional aims, instructional focuses of these aims, and instructional activities used to achieve them.

This is not the first attempt to specify the design principles underlying SRSD instruction. For example, the logic behind SRSD was presented in a 1992 book by Harris and Graham. In addition, we have previously identified instructional activities in

SRSD used to enhance attention, memory, executive functioning, and metacognition (Graham & Harris, 1996; Graham, Harris, & Olinghouse, 2007; Harris, Graham, Brindle, & Sandmel, 2009). Moreover, we conducted studies to determine if specific instructional activities (goal setting and self-monitoring) account for some of the gains made by SRSD instructed students (e.g., Sawyer, Graham, & Harris, 1992). They further investigated where in the instructional process students' gains become evident (e.g., Danoff, Harris, & Graham, 1993).

Nevertheless, our analysis is the most ambitious attempt to identify the instructional principles underlying SRSD instruction conducted to date, as it included not only SRSD but the PBPD model used to teach it. This allowed us to focus on student instruction, teacher development, and the context within which each took place using a model based on both social/contextual and cognitive theory (Graham, 2018).

While we believe that it is important for researchers to unpack the thinking and design principles underlying their interventions, our current analysis raises several points of caution when such an analysis is applied to complicated interventions like SRSD. Quite naturally, there is an inclination for those who want to apply such procedures in the classroom or in additional research experiments to ask: "What is the secret sauce? What is it that makes SRSD effective?" We want to isolate exactly what leads to improved writing performance. When moved to a larger scale such as meta-analyses, we may be tempted to try to identify the common active ingredients responsible for writing gains across different writing interventions, as Hillocks (1986) attempted to do in his seminal meta-analysis of writing interventions.

This goal to deconstruct and identify the specific design principles responsible for student writing gains may be successful with interventions that are relatively simple like goal setting, but it becomes increasingly difficult to do so with larger and more complicated interventions like SRSD, as we hope our analysis made clear in this article. Student success in the Harris et al. (2012a) study likely rested of the interaction of four primary goals of instruction: creating effective PBPD or SRSD, reshaping teachers' classrooms to be conducive to SRSD instruction, enhancing teachers' capabilities and motivations to teach SRSD, and improving students' capabilities and motivations to write opinion essays using SRSD. These goals are interconnected. They were not built to be independent, but were designed to be mutually supportive. Tables 1 to 4 provide multiple examples of where the same instructional activity was used to address more than one instructional focus. In addition, the same activity was often designed to effect change across different participants (teacher and students) and contexts (professional development setting and classroom).

This process of identifying the "secret sauce" is further complicated in complex interventions like SRSD, where the instructional regime, even when reduced to specific lesson plans or a video representation of instruction, are meant to serve as a meta-script to illustrate the basic principles underlying the intervention (Harris et al., 2008). Further, SRSD is viewed by Harris and Graham (Harris et al., 2008) as a flexible intervention that grows and changes over time. For example, in a study by Sexton et al.

(1988), SRSD was changed by placing a greater emphasis on attribution retraining. This became a common feature of SRSD instruction. Likewise, some of the instructional components of SRSD can be implemented in different ways (e.g., Harris, Graham, & Mason, 2006). For instance, the strategies taught may differ (e.g., revising strategies in Stoddard & MacArthur, 1993; planning and drafting strategies in Limpo & Alves, 2014); additional instructional procedures may be added depending on the needs of the students (e.g., Graham, Harris, & Mason, 2005 added procedures for promoting generalization and maintenance); and grouping of students may vary from individual (Jacobson & Reid, 2010) to small group (Harris et al., 2015), to whole class (Festas et al., 2015). While there is considerable overlap in the design principles underlining all SRSD studies conducted to date (this is also true for PBPD), there are differences too. For instance, SRSD instruction as envisioned by Harris (Graham & Harris, 2016) is a mastery learning approach (e.g. Zumbrunn & Bruning, 2013), but some studies have applied a time-based approach to instruction (Limpo & Alves, in press). Consequently, the analysis of the design principles underlying Harris et al. (2012a) in this article should not be viewed as fully representing all SRSD studies, although most of the basic principles identified would be consistent with most studies.

It should be noted that we did not use a reporting system designed by Rijlaarsdam, Janssen, Rietdijk, and van Weijen (2016) to deconstruct SRSD (this was used by other authors in this special issue). The major differences between the framework we employed and the one they developed is that we did not identify a learning activity (e.g., observe and discuss how a teacher models the strategy) and separately describe the teaching activity (e.g., teacher models the strategy while thinking out loud). Instead, we presented these two description under a single category: instructional activity. There is nothing wrong with Rijlaarsdam and colleagues reporting system, but as the example above illustrates there is redundancy in what is reported and, in our opinion, teaching and learning activities work together to achieve their designated aim and it is difficult to always pull the two apart.

In closing, we want to reiterate that it is critical that researchers identify the design principles underlying writing interventions they create, test, or both. This will help them and those who use the intervention to better understand it. It is also important to realize that these conceptualizations will likely change over time, and should be updated periodically as we have done here. Further, the more complicated the intervention, the more difficult it will be to identify exactly which instructional ingredients are responsible for student, teacher or context change. This is not to say that researchers should abandon such efforts. For example, our findings that the self-regulation components of SRSD made a unique contribution to improving students' performance (e.g., Sawyer et al., 992) highlighted the importance of these procedures to the overall model. Similarly, our findings that stopping SRSD instruction at modeling produced little gain in writing (e.g., Danoff et al., 1993) helped clarify the importance of the support it and independent performance stages to the success of the SRSD model. While we encourage such efforts, we think that the "secret sauce" is not just about one,

two, or three specific ingredients, but the complex interplay of the multiple ingredients in the SRSD recipe.

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