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Recent legislation related to dyslexia has increased the focus on how reading is being taught in schools and how teachers are prepared to teach reading at the pre-service level. One promising teaching approach to supporting students with reading difficulties is the self-regulated strategy development (SRSD) model. However, there is limited research regarding whether the model can be implemented by pre-service teachers while still remaining effective. This study investigated the effects and fidelity of implementation of pre-service teacher implemented SRSD on the reading comprehension of middle school students identified as struggling in reading. A multiple baseline design across participants was used. Two undergraduate, pre-service teachers provided instruction. Participants were seven middle school students that demonstrated reading comprehension deficits. All instruction was provided in pairs or small groups. Results indicate that pre-service teachers can adhere to SRSD components and have a positive effect on students' reading comprehension when implementing SRSD. Ideas for future research and implications are discussed.
      Keywords: Pre-service teachers, strategy instruction, reading comprehension

By the end of 2018, more than 40 states had dyslexia-specific laws in place (Lindstrom, 2019; Youman & Mather, 2015) and many of the remaining states without dyslexia laws have dyslexia-related legislative bills under consideration (National Center on Improving Literacy, 2018). Dyslexia can be understood as reading disorder that can be categorized as a specific learning disability (SLD) according to IDEA (2006). The core problems associated with dyslexia involve decoding and printed words (e.g., Hudson, High, & Al Otaiba, 2007) resulting in in difficulty with understanding written material (Lindstrom, 2019). Students with Dyslexia may also experience difficulties in other areas, such as semantics, syntax, self-monitoring, and executive functions (see Cain & Oakhill, 2011; Locascio, Mahone, Eason, & Cutting, 2010). The recent push for state legislation related to dyslexia has increased the focus on not only on reading disabilities, but how reading is being taught in schools. For many

states, this increased attention has resulted in legislation focused on specific literacy training for pre-service teachers to ensure access to and understanding of evidence-based, explicit, systematic, and sequential approaches to reading instruction (e.g., Nebraska Department of Education, 2018; Tennessee Department of Education, 2017).

One teaching approach that has been cited as an evidence-based practice and is explicit, systematic and sequential is the self-regulated strategy development (SRSD) model (see What Works Clearinghouse, 2017). The SRSD model is an instructional approach that provides teachers with a "road map" for how to teach strategies to students while addressing the development of self-regulation and executive functions, often discussed as areas of deficit for many students with disabilities (see Gooch, Snowling, & Hulme, 2010). The SRSD framework combines explicit instruction in knowledge of content (e.g., reading, writing), strategy acquisition, and self-regulation to support success in the reading process. SRSD is characterized by the following six flexible phases of instruction: (a) Develop background knowledge, (b) Discuss it, (c) Model it, (d) Memorize it, (e) Support it, and (f) Independent performance (see Harris, Graham, Brindle, & Sandmel, 2009; Harris, Graham, Mason, & Friedlander, 2008). Across several meta-analyses, explicit instruction in strategies consistently produced positive effects on students' writing performance (e.g., Gillespie & Graham, 2014; Graham et al. 2012). In addition to being well-documented as an effective approach in the area of writing, several studies have identified that reading comprehension is also an area in which SRSD can be taught (Sanders et al., 2019), with several studies

(see Ennis, 2016; Howorth, Lopata, Thormeer, & Rogers, 2016; Mason, Snyder, Sukhram, & Kedem, 2006) finding positive results from implementing reading comprehension strategies through an SRSD framework.

While the SRSD model has been successfully implemented in a variety of instructional contexts, the vast majority of research with SRSD has been implemented by trained graduate students or teachers with extensive training (12 – 14 hours following a graduate degree). Research with SRSD has recently begun to focus on the effects of practice-based professional development (PBPD) and have found practicing teachers are able to implement SRSD with fidelity and find improvements in their students' writing skills in the classroom (see Festas et al., 2015; McKeown, FitzPatrick, & Sandmel, 2014; McKeown et al., 2016). However, one of the areas in which there is limited research on SRSD is whether effects can be found when pre-service teachers implement the model. That is, it is unknown whether pre-service teachers are able to implement the stages of SRSD with fidelity and to have positive impacts on student performance when using the model. This is of interest because SRSD is somewhat prescriptive and provides a basic framework of good teaching for pre-service teachers to follow while they learn to plan and implement lessons. As a result, SRSD is one such framework that provides a series of stages that help new or preservice teachers to ensure they follow the necessary steps and stages when teaching. However, to date, there are no published studies demonstrating whether preservice teachers are able to use the SRSD model or to use it with fidelity of implementation.

Given the increased focus not only on the quality of reading instruction being

provided in schools but on the ways in which pre-service teachers are prepared to understand and implement evidence-based practices and explicit instruction, further investigation into practices such as SRSD with pre-service teachers is warranted. Therefore, the purpose of this pilot study was to investigate whether preservice teachers would be able to understand and implement a reading comprehension strategy using the SRSD model as a guide to planning effective lessons.

One relatively easy reading comprehension strategy is the TRAP strategy (Mason, Reid, & Hagaman, 2012). The TRAP strategy is based on the Paraphrasing Strategy (Schumaker, Denton, & Deschler, 1984) and focuses on the basics of the reading process: pre-reading, reading and checking for understanding, summarizing/paraphrasing. The steps of the strategy are: (1) Think about what you are going to read, (2) Read a paragraph, (3) Ask yourself "What was the main idea and two details" and (4) Paraphrase that information. Several published studies have documented positive effects when trained graduate students or licensed teachers implement the TRAP strategy with the SRSD model (see Hagaman, Casey, & Reid; 2012). As a result, this simple, promising strategy was paired with the SRSD model to determine whether preservice teachers would be able to implement the SRSD model in a small group setting with adequate fidelity of implementation.

Method
Design
The current study used a multiple baseline design across participants with multiple probes given during baseline (Kazdin, 1982). The middle school students were instructed in groups of two or three,

systematically and in turn. Prior to beginning instruction, each participant's baseline for typical reading comprehension was measured multiple times. A functional relationship between the independent variable and the participants' progress was established if the target behavior increased (i.e., percent retell) after completion of the strategy instruction and if the participants who had not yet completed strategy instruction remained at or near pre-intervention levels during baseline. Data were analyzed via visual inspection to examine stability, level, and trend (Kazdin, 1982). Effect size estimates were calculated using Nonoverlap of All Pairs (NAP), following guidelines by Parker, Vannest, and Brown (2009). Parker and colleagues (2009) recommended the following NAP interpretation guidelines: weak effects: 0-.65, medium effects: .66-.92, and large or strong effects: .93-1.0.

Participants
Pre-service teachers. Two undergraduate, pre-service teachers were selected to participate in this study as instructors for the TRAP strategy. Both pre-service teachers were female, white, and in their early twenties. The pre-service teachers were selected based on the following criteria. First, the pre-service teachers needed to be in the last year of their special education undergraduate certification program. Second, the pre-service teachers needed to be enrolled in a special education methods and interventions course and corresponding practicum experience. Finally, the pre-service teachers needed to have at least one prior practicum of at least 40 hours in a general education setting. Using these criteria, five pre-service teachers were initially identified. These five pre-service teachers were approached and asked if they

would be interested in being involved in a research study instead of their typical fieldwork (which also required them to work in small groups with students). Two pre-service teachers agreed to participate and signed consent.

Middle-school students. Seven middle school students were also participants in this study. Table 1 shows participant demographic information. Middle-school participants were selected using the following procedure.

Table 1.
Middle school participant information

		Gender	Grade	Ethnicity	Special Education Status
Group 1	Frank	M	7	White	Specific Learning Disability
Licensed Teacher	Kendra	F	7	Hispanic	NA
Group 2	Emily	F	6	White	NA
Pre-service Teacher A	Delaney	F	6	White	NA
Group 3	Noah	M	6	White	NA
Pre-service Teacher B	Zach	M	6	White	Other Health Impairment-ADHD
	Lisa	F	6	Hispanic	NA

First, three reading teachers, two special education teachers, and the school principal were asked to identify students demonstrating reading comprehension deficits that were also documented as fluent readers based recent test scores from the Measures of Academic Progress (MAP; Northwest Evaluation Association, 2015). At this step 12 students were identified. These students earned scores from early 4th to mid-5th-grade levels based on the MAP. Second, consent forms were sent to the participants' caregivers - seven were returned with signatures authorizing their participation in the study. Finally, the reading fluency of the seven students was assessed by the first two authors using DIBELS (Good & Kaminski, 2008) to ensure that the students were able to fluently read passages written at the 4th-

grade level to ensure minimal fluency when reading passages.

Setting

The study was conducted during the spring semester at a rural middle school in the Midwest. There were 441 students enrolled in the school at the time of the study. Of these students, 28% were minorities, 20% received special education services, and 46% received free or reduced lunch. All instruction took place in the afternoon during regularly scheduled reading intervention period. This was a one-hour reading block of functional reading curriculum focusing on elements of writing (e.g., grammar, editing), analyzing text for meaning, and building vocabulary.

Dependent Measures

There were two dependent measures for this study. First, fidelity of implementation (i.e., treatment integrity)

for the TRAP strategy when delivered by pre-service teachers was measured. Second, data on middle school student reading performance were collected to determine whether the effects of the TRAP strategy delivered by pre-service teachers were similar to those obtained by a certified instructor.

Fidelity. The following procedures were used to ensure consistent implementation of the TRAP strategy and determine whether pre-service teachers were able to implement research-based practice with high fidelity of implementation. First, the first and second authors created fidelity checklists for each lesson. These fidelity checklists and lessons were based on those in Mason, Reid, and Hagaman (2012) and had a total of six lessons and corresponding fidelity checklists. The six lessons varied from 18 to 26 opportunities to demonstrate a necessary component of a lesson. Beginning lessons (i.e., lessons one and two) had more expected elements on the fidelity checklists

and later lessons (i.e., lessons five and six) had were expected elements because of the increased focus on student practice. Each fidelity checklist contained several items related to SRSD components (e.g., introducing the strategy, helping students to set an appropriately challenging goal) and elements related to effective instructional practices (e.g., pacing, materials ready, instructor enthusiasm). These fidelity checklists were used during instruction to ensure all necessary steps were completed. The instructors were required to check each completed step on the checklist as it occurred before moving on to the next step of the lesson. Third, all instruction was video recorded for the purpose of establishing fidelity. The first and second authors viewed all video recordings and completed fidelity checklists of every lesson delivered by the two pre-service teachers and conducted fidelity checks. See Figure 1 for an example fidelity checklist.

Figure 1.
Example retell checklist Lesson One

Components	Observed	
	Yes	**No**
Set context for student learning		
Discussed importance of remembering what you read		
Introduced students to graph and their current performance in reading comprehension		
Develop background knowledge		
Addressed why it is good to use strategies		
Acquired "buy-in"		
Introduced steps of the TRAP strategy		
Discuss TRAP steps		
Described each step		
Gave examples of how to complete each step		
Obtaining commitment		

Encouraged students to use the TRAP strategy		
Discussed when it would be a good time to use the strategy		
Obtained verbal commitment		
Set a goal		
Discussed why it is important to set goals		
Prompted students to set a goal		
Assisted students in creating realistic goals		
Memorization		
Worked on memorization		
Allowed students time to practice memorizing		
Prerequisites		
Explained to students how to identify main ideas and details		
Allowed students opportunity practice identifying main ideas and details		
Practiced paraphrasing		
Wrap-up/Generalization		
Reminded to practice		
Reminded to memorize		
Teacher behavior		
Materials ready for each activity		
Instruction delivered with enthusiasm		
Maintained appropriate pace during instruction		
Monitored and checked for understanding		

Treatment Fidelity:

Total Yes	
Total	
% Fidelity	

Percent of text recalled. Procedures used to assess the percentage of text recalled by the middle school students were those developed by Hagaman and Reid (2008) which are based on the Qualitative Reading Inventory (QRI; Leslie & Caldwell, 2011). The QRI assesses reading comprehension by requiring students to orally retell a story and answer implicit and explicit short answer questions. The texts used to create these measures were Leveled Texts for Social Studies: Early America (Housel, 2007). These texts were selected because there are a sufficient number of passages at four distinct reading levels. In addition, the teachers who were consulted prior to instruction were interested in their students' ability to use the strategy on content area text (e.g., Social Studies). The authors selected passages at the fourth-grade level to ensure that students would be able to read the passages with fluency. Passages ranged in length from 335 to 383 words.

Participants were presented with a passage and asked to read it silently. After reading, each participant was asked to tell everything he/she could remember about the passage just read. The participants retelling of the content was scored on a retell checklist of important idea units in the selected passage. The number of main idea statements included in each passage ranged from five to six. The number of details included in each passage ranged from 25 to 30. Participants were not expected to recall the exact words in the passage. It was acceptable for students to paraphrase or to use phrases similar to those in the passage. Participants received credit for all correctly recalled main idea and detail units from a given passage. The percentage of text recalled was calculated separately for main ideas, details, and total number of idea units recalled. All middle school student responses were audio-recorded to calculate the inter-observer agreement.

Procedures

Training of pre-service teachers. Before the start of the study, the pre-service teachers participated in 15 hours of instruction about general research procedures, the SRSD model and how to implement the TRAP strategy using the SRSD model. First, the pre-service teachers received a binder of materials including a description of the six steps of the SRSD model, six scripted lesson plans, lesson plan checklists (i.e., fidelity checklists), and instructions for implementing the TRAP strategy. Second, the first and second authors discussed these materials to establish an understanding of the SRSD model and instruction. Third, the pre-service teachers watched videos of the TRAP strategy and SRSD instruction delivered by the first author. While viewing,

the pre-service teachers were asked to use the fidelity checklists from each lesson to identify the components of each lesson. The student was encouraged to take notes and ask questions regarding implementation. Finally, the student was asked to teach each lesson (to a peer) and videotape their instruction. The first and second authors independently viewed the videos and used the fidelity checklists for each lesson to evaluate the undergraduate's instruction. The first and second authors also met individually with the pre-service teachers to show positives from the video (e.g., steps that were done well, use of good instructional techniques) and areas for improvement. Training was complete when 90% fidelity was met according to the lesson fidelity checklist.

Research Procedures

Baseline phase. Middle-school participants were individually given a reading passage and told to read the passage to themselves. Highlighters, pens, pencils, and paper were made available to the students. Participants were told they could ask the instructor to read any word they did not recognize. Instructors did not provide any additional support, assistance, or encouragement. When the participants were done reading, the passage was removed, along with any notes taken during reading. Participants were individually asked to tell everything they could remember about what they just read. The instructors did not indicate correct or incorrect responses or provide any additional assistance.

Instruction phase. Once the first group's baseline performance was stable, they received instruction in the TRAP strategy while the other two groups remained in baseline. Data were not collected during the instruction phase as

participant performance was supported by the instructor(s) and did not accurately reflect the independent use of the strategy.

Post-instruction phase. After each group completed the instruction phase, additional dependent measure probes (i.e., oral retell) were administered. These probes were administered under the same conditions as the baseline probes. Instruction, prompts, and additional support were not provided during this phase.

Instructional Procedures for Teaching the TRAP Strategy

General instructional procedures. The six lessons used were adapted from those developed by Mason, Reid, and Hagaman (2012). Instruction was systematically scaffolded to gradually shift responsibility of strategy use from the instructors to the participants. Feedback and instructional support were individualized and faded as the participants began to master each step of the strategy. All instruction was provided in pairs or small groups.

The SRSD model was used to teach the TRAP paraphrasing strategy. There are six stages in the SRSD model. In the first stage, Develop and Activate Background Knowledge, the instructors discussed the importance of remembering what is read. The instructors asked students to think about "what kinds of things we read" and "why we read." During this discussion, the instructors emphasized that good readers "understand what they read," "check to make sure they understand what they read," and "have fun." The instructor further explained that they were going to teach the students a "trick" to help them remember the things that all good readers do when they read.

In the second stage, Discuss the Strategy, the instructors ask for the students to commit to learn and use the TRAP strategy and the steps of the strategy are formally introduced along with prompts (e.g., graphic organizers, visuals). After a discussion of the strategy, participants were asked to read one paragraph of a passage aloud and identify the main idea and at least two important details. They were then asked to write down the main idea and details to ensure they each had the necessary prerequisite knowledge to successfully use the TRAP strategy. After checking for correct responses in the first paragraph, the students were then asked to identify main ideas and details in the remainder of the passage.

Memorization of the TRAP strategy was facilitated in this stage and throughout instruction. Students were expected to know the steps of TRAP and the activities to conduct during each step. After students practiced memorizing the strategy, they were given opportunities to practice the steps of the strategy on a passage. Finally, the instructors encouraged students to transfer strategy use to other settings. For example, the instructors asked students to identify situations in which the strategy would be useful (e.g., at home when reading homework assignments) and encouraged students to use the strategy before the next lesson.

Goal setting and self-monitoring procedures also were introduced at this stage. Students were shown a graph of their performance data collected during baseline. After discussing this performance, students were asked to set a goal related to how much information they would like to retell from a given text using the TRAP strategy. Instructors assisted students in setting a realistic goal based on their previous performance (e.g., if a student recalled 13%

of text in baseline, a realistic goal might be 50%). Students were told they would record their future performance on a graph to self-monitor progress toward their self-determined goal.

In the third stage, Modeling the Strategy, the instructors modeled the strategy using a "think aloud" procedure. This allows the students to observe an "expert" learner using the strategy. While modeling, the instructors verbalized her thought processes and demonstrated how to use strategy on a multi-paragraph passage.

In the next stage, Support It, the instructors worked collaboratively with students until they are able to demonstrate independent use of the strategy. During this stage, students were provided assistance only when required. First, the instructors provided passages for the students to practice the TRAP strategy. Students were able to use any additional materials, such as the visual prompt with the steps of the TRAP strategy. Instructors reminded students to paraphrase at the end of each paragraph after taking notes (e.g., writing the main idea and details). After reading the passage, students were asked to retell what they could remember about what they just read, but were not allowed to reference the passage while retelling. The students would then graph their performance to self-monitor their progress toward their predetermined goals.

The final stage of the SRSD model is Independent Performance. This stage was achieved when the students were able to independently use the TRAP strategy. This generally occurred after 4 – 6 lessons. In some cases, students were able to independently use the strategy by the end of lesson 4, in which case, the remaining 2 lessons provided additional practice while

another student might still require support with some steps of the strategy.

Interobserver Agreement

Interobserver agreement (IOA) was calculated using point-by-point agreement (agreements ÷ [agreements + disagreements] × 100; Kazdin, 1982) for the fidelity checklists and middle school students' retelling of passages.

Fidelity. The first and second authors independently viewed the videos of pre-service teachers implementing the TRAP strategy. The fidelity checklists were used to determine a percent of fidelity of implementation for each lesson. An agreement was scored if both authors agreed that an instructional element was present in the video (e.g., reviewing from the previous lesson, appropriate pacing). The percentage of agreement for fidelity of implementation was 100%.

Retell. The first and second authors independently scored the retell and question information. The first and second authors listened to all story retells from middle school students. An agreement was scored if both authors agreed that a participant recalled a specific main idea or detail unit. The percentage of agreement for text recalled was 95%.

Results

Fidelity of Implementation

The pre-service teachers were able to implement the TRAP strategy following the SRSD model with 87% fidelity of implementation across all six lessons. Table 2 shows the fidelity of implementation for each lesson and each instructor, including the licensed teacher. While fidelity of implementation remained high across the six lessons, the pre-service teachers did have some fluctuation, especially in later lessons.

Table 2.
Fidelity of implementation across 6 lesson plans

|	Licensed Teacher Fidelity of Implementation	Pre-Service Teacher A Fidelity of Implementation	Pre-Service Teacher B Fidelity of Implementation
Lesson 1	95.8	87.5	91.6
Lesson 2	99	92.3	92.3
Lesson 3	95.6	91.3	86.5
Lesson 4	94.7	89.4	94.7
Lesson 5	99	82.3	76.5
Lesson 6	99	88.2	82.3
Mean Fidelity of Implementation	97.2	88.5	87.3

The elements most consistently missed on the fidelity checklists across both pre-service teachers related to maintaining appropriate pacing, delivering instruction with enthusiasm, monitoring for student understanding and altering instruction as necessary, and providing specific feedback.

Percentage of Text Recalled

The percentage of text recalled for each of the seven middle-school participants is displayed in Figure 2.

Figure 2.
Percentage of Text Recalled
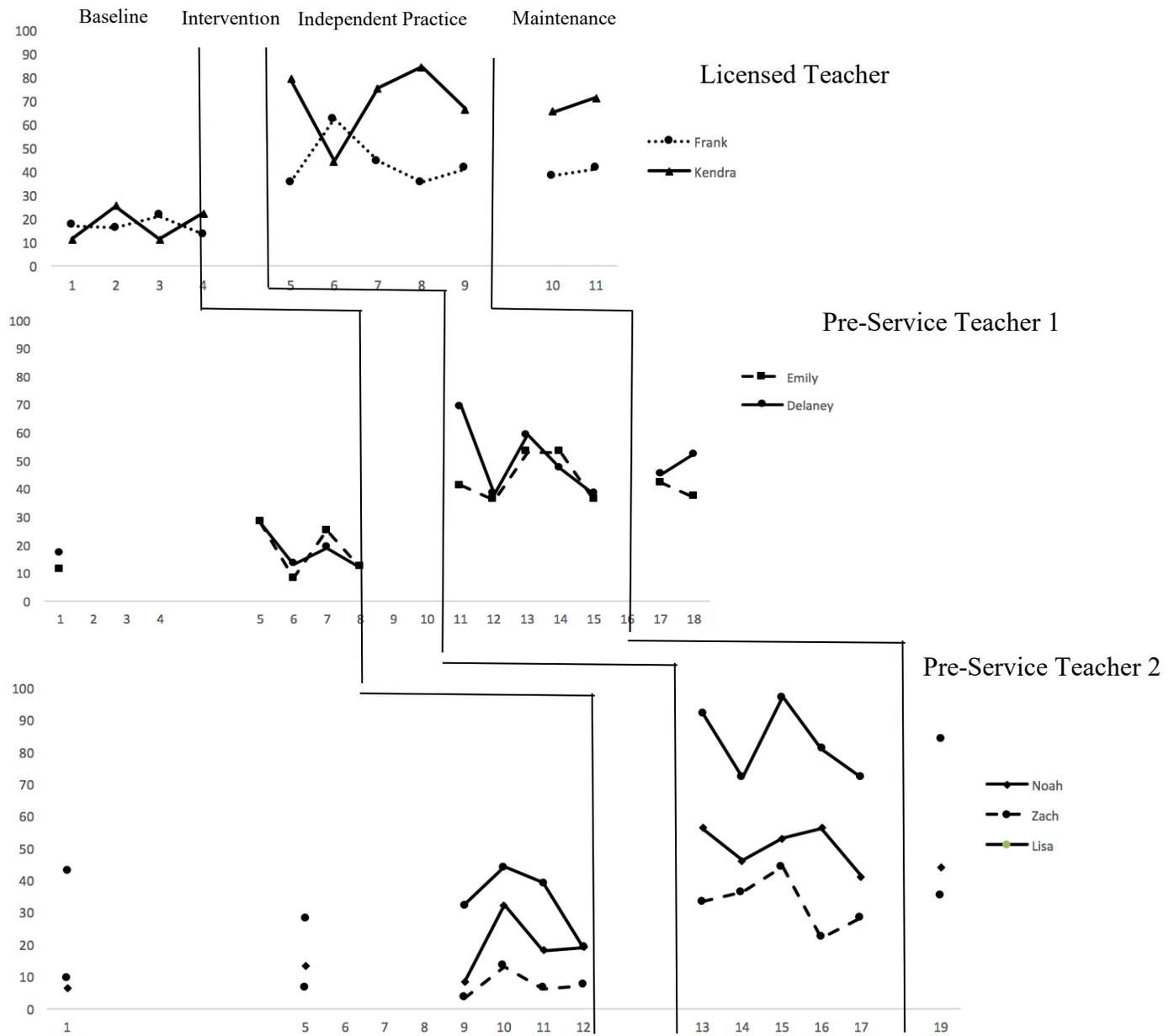
Baseline performance remained stable and at low levels for all participants. The mean percentage of text recalled (i.e., including main ideas and details) in baseline for Frank, Kendra, Emily, Delaney, Noah, Zach, and Lisa was 16.8%, 17.3%, 16.8%, 17.8%, 16.0%, 7.3%, 34.2%, respectively. Performance increased immediately for all participants following treatment. The mean percentage of text recalled during independent performance (i.e., including main ideas and details) for Frank, Kendra, Emily, Delaney, Noah, Zach, and Lisa was 43.4%, 69.6%, 43.8%, 50.2%, 50.4%, 32.6%, 82.8%, respectively. Percentage increase for Frank, Kendra, Emily, Delaney, Noah, Zach,

and Lisa was 158%, 302%, 160%, 182%, 215%, 346%, and 142%, respectively.

Discussion

The results of this study suggest that the TRAP paraphrasing strategy paired with strategy instruction using the SRSD model can improve the reading comprehension of middle schoolers who struggle with reading comprehension when delivered by pre-service teachers. In this section, we first discuss the results of each dependent measure in turn. Next, we discuss the limitations of the study, future research, and the implications of the study.

Fidelity of Implementation

Results for treatment integrity for the TRAP strategy delivered by pre-service, undergraduate students were positive. Treatment integrity was high (i.e., 87%) across all six lessons delivered by the undergraduate students. The treatment integrity checklists developed for each lesson contained the SRSD elements present in the lesson (e.g., introduce the strategy, set goals with students) and broad effective instruction elements such as appropriate pacing, enthusiasm, and using specific praise as necessary. While treatment integrity was high (i.e., 87%) across SRSD elements and effective instructional elements, when looking at the fidelity checklists it was noted that treatment integrity was higher for SRSD elements than the effective instructional elements for each lesson. Specifically, the pre-service teachers were able to address all SRSD elements in a lesson, but would occasionally struggle with effective pacing, especially when the lessons required them to adjust instruction and quickly respond to student performance (e.g., scaffolded lessons such as lessons 4, 5, and 6). This could be because the training for the pre-service teachers focused primarily on research practices and SRSD instruction. Future research involving pre-service teachers should include instruction and modeling of effective instructional practices in addition to research and SRSD to ensure that treatment fidelity remains high and effective instructional techniques are consistently used.

However, it is also important to note that some of these skills, such as appropriate pacing and delivering instruction with enthusiasm, may not be fully developed in pre-service teachers until they have had more opportunities in the classroom. Because the pre-service teachers in this study had not yet engaged in their clinical practice (i.e., student teaching experience), they had not had extensive experiences practicing the integration of both effective general teaching practices (e.g., appropriate pacing, enthusiasm) along with an instructional framework such as SRSD. Utilizing practices such as the SRSD model along with generally effective practices could potentially take time to develop with pre-service teachers.

Percentage of Text Recalled

The effects of strategy instruction on text recall were pronounced and immediate for the majority of middle-school participants. All middle-school student retell levels improved immediately following strategy instruction. For Kendra and Zach, gains around 300% were found; Emily and Delaney improved 158% and 182%. Frank, Noah, and Zach recalled fewer main ideas and details but still made substantial improvements following strategy instruction. NAP for all participants was 1.0, which indicates that the effects of the intervention were large for oral retells. This is consistent with previous studies that suggest the paraphrasing strategy can

improve the reading comprehension scores of struggling readers (Ellis & Graves, 1990; Hagaman & Reid, 2008; Hagaman, Casey, & Reid, 2012). Thus, the findings from this study suggest that strategies such as TRAP, when taught using a strategy instruction model such as SRSD, can help students increase their recall of text in a relatively short amount of time.

In addition, it should be noted that the pre-service teachers, despite some minor issues with fluctuation in adherence to fidelity checklists, were still able to find similar results with their middle-school students on strategy use (i.e., how well the students knew the strategy) and outcomes on reading comprehension (i.e., retell). This suggests that having a model to follow that is based on practices such as explicit instruction and supporting students (i.e., scaffolding) is effective not only for pre-service teachers, but can have positive effects on the students they work with. Having an evidence-based model that encompasses best practices (e.g., explicit instruction, metacognitive strategies) provides pre-service teachers with a necessary, effective guide as to what good teaching entails. Moreover, this study suggests that the SRSD model is easy to follow, even for pre-service teachers with limited teaching experiences.

Limitations

There are several limitations that should be noted. First, because a treatment package consisting of the TRAP strategy along with self-regulation interventions and goal setting was used, we cannot determine which component was responsible for the observed effects in student performance. Future research should attempt to determine if the TRAP strategy, goal setting, and self-monitoring, or a combination of the two is responsible for the effects found

in this study. Second, generalization to other settings or with other instructors was not assessed in this study, thus it was not determined if the students could use the strategy to improve their performance in the classroom. Third, all tasks assessed immediate recall of text read. Future research should examine the effects of delayed recall. Fourth, the reading probes used in this study were researcher-developed , which may have influenced some of the findings. For example, because the reading passages came from a social studies book, some passages or content may have been familiar to students. This may have influenced student scores on retelling and short-answer questions. Finally, the selection of pre-service undergraduate teachers to include as the teachers for two groups of students was not randomized and relied on volunteering. It is possible that any effects found related to fidelity of implementation and student outcomes may not be replicated with other pre-service teachers. Future studies should consider further investigating the effects of SRSD when taught by pre-service teachers.

Implications

The current study found that pre-service, undergraduate teachers with some specialized training in SRSD were able to implement lessons focused on strategy instruction, with high fidelity of implementation while also finding positive effects in the TRAP strategy for the middle schoolers they were teaching. This suggests that the SRSD model can remain an effective practice, even when delivered by pre-service teachers with limited training as the pre-service teachers were able to implement a research-based practice (i.e., SRSD) with acceptable fidelity and the effects attained were commensurate with those of trained researcher and licensed

teacher. Future research should further investigate whether the use of the SRSD model with preservice or new teachers could provide an important "road map" to effective teaching. This could particularly help those teachers who are provisionally hired in special education positions in combination with practice-based professional development, as teachers new to special education or teaching may need guidance for what effective teaching looks like. If these provisionally licensed teachers were trained on the SRSD model in a few seminar sessions (online or in-person) or professional development days while also receiving targeted support in the field from mentors, there is reason to believe, based on these findings and others (see Festas et al., 2015), that these teachers would be able to adhere to the stages of SRSD and appropriately support their students. In addition, learning about the stages of SRSD could help these teachers develop knowledge about what effective teaching practices are (e.g., explicit instruction, modeling with metacognition, goal-setting, scaffolding).

Finally, SRSD for preservice teachers is a promising area for further consideration. Not only does SRSD pair with multiple strategies (e.g., writing, reading), which makes it flexible and highly applicable across subjects and grade levels, but this study suggests it is easy to learn while still finding positive outcomes with k-12 students. Future research should consider using SRSD as an initial framework for understanding effective instruction as opposed to simply focusing on lesson planning. In many teacher preparation institutions, several courses focus on planning lessons. While this is a necessary set of skills to develop in pre-service teachers, SRSD provides a broader framework for how to plan and instruct beyond one lesson at a time. SRSD may be helpful to pre-service teachers as a "second step" after learning how to plan and implement individual lessons, to provide pre-service teachers with a series of fluid steps to follow to help them plan for how and when to scaffold and develop support lessons.

References

Cain, K., & Oakhill, J. V. (2011). Matthew effects in young readers: Reading comprehension and reading experience aid vocabulary development. *Journal of Learning Disabilities, 44*, 431–443. doi:10.1177/0022219411410042

Ennis, R. P. (2016). Using self-regulated strategy development to help high school students with EBD summarize informational text in social studies. *Education and Treatment of Children, 39*(4), 545–568. doi:10.1353/etc.2016.0024

Festas, I., Oliveira, A. L., Rebelo, J. A., Damiao, M. H., Harris, K., & Graham, S.

(2015). Professional development in self-regulated strategy development: Effects on the writing performance of eighth grade Portuguese students. *Contemporary Educational Psychology, 40,* 17–27.

Gillespie, A., & Graham, S. (2014). A meta-analysis of writing interventions for students with learning disabilities. *Exceptional Children, 80*(4), 454-473

Gooch, D. Snowling, M. & Hulme, C. (2010). Time perception, phonological skills and executive function in children with dyslexia and/or ADHD symptoms. *Journal of Child Psychology and*

Psychiatry, 52, 195-203. doi:
10.1111/j.1469-7610.2010.02312.x

Good, R. H., & Kaminski, R. A. (Eds.). (2008).
*Dynamic Indicators of Basic Early
Literacy Skills* (6th ed.). Eugene, OR:
Institute for the Development of
Educational Achievement. Available
from http://dibels.uoregon.edu/

Graham, S., McKeown, D., Kiuhara, S., &
Harris, K. R. (2012). Meta-analysis of
writing instruction for students in
elementary grades. *Journal of
Educational Psychology, 104*(4), 879-896

Hagaman, J. L., & Reid, R. (2008). The
effects of the paraphrasing strategy on
the reading comprehension of middle-
school students at-risk for failure in
reading. *Remedial and Special
Education,* 29, 222–234.

Hagaman, J. L., Casey, K. J., & Reid, R.
(2012). The effects of the paraphrasing
strategy on the reading comprehension
of young students. *Remedial and Special
Education, 33,* 110- 123.

Harris, K. R., Graham, S., Brindle, M., &
Sandmel, K. (2009). Metacognition and
children's writing. In D. Hacker, J.,
Dunlosky, & A. Graesser (Eds.),
*Handbook of metacognition in
education.* (pp. 131 – 153). Mahwah,
NJ: Erlbaum.

Harris, K. R., Graham, S., Mason, L. H., &
Friedlander, B. (2008). Powerful writing
strategies for all students. Baltimore,
MD: Brookes.

Houselm, D. (2007). Leveled Text for Social
Studies: Early America. Huntington
Beach, CA: Shell Publishing.

Howorth, S., Lopata, C., Thomeer, M.,
& Rodgers, J. (2016). Effects of the TWA
strategy on expository reading
comprehension of students with autism.
British Journal of Special

Education, 43(1), 39–59.
doi:10.1111/1467-8578.12122

Hudson, R. F., High, L., Al Otaiba, S.
(2007). Dyslexia and the brain: What
does current research tell us?. The
Reading Teacher, 60, 506–515.

Individuals with Disabilities Education Act,
20 U.S.C. §§ 1400 et seq. (2006 & Supp.
V. 2011)

Institute of Education Sciences. (2017). Self-
Regulated Strategy Development.
Retrieved
from https://ies.ed.gov/ncee/wwc/Docs
/InterventionReports/wwc_srsd_11141
7.pdf

Kazdin, A. E. (1982). *Single case research
designs: Methods for clinical and applied
settings.* New York: Oxford University
Press.

Leslie, L., & Caldwell, J. (2011). *Qualitative
Reading Inventory–5.* Reading, MA:
Addison-Wesley.

Lindstrom, J. H. (2019). Dyslexia in the
Schools: Assessment and
Identification. *TEACHING Exceptional
Children*, *51*(3), 189–
200. https://doi.org/10.1177/00400599
18763712

Locascio, G., Mahone, E. M., Eason, S. H.,
Cutting, L. E. (2010). Executive
dysfunction among children with
reading comprehension deficits. Journal
of Learning Disabilities, 43, 441–454.
doi:10.1177/0022219409355476

Mason, L.H., Reid, R. & Hagaman, J. L.
(2012). *Powerful strategies that improve
adolescents' self-regulation: Reading
and writing to learn in content*. Brookes
Publishing: Baltimore.

Mason, L. H., Snyder, K. H., Sukhram, D. P.,
& Kedem, Y. (2006). TWA + PLANS
strategies for expository reading and
writing: Effects for nine fourth-grade
students. *Exceptional*

Children, 73(1), 69–89. doi:10.1177/001440290607300104

McKeown, D., Brindle, M., Harris, K. R., Graham, S., & Collins, A. A. (2016). Illuminating growth and struggles using mixed methods: Practice-based professional development and coaching for differentiating SRSD instruction in writing. *Reading and Writing: An Interdisciplinary Journal*. Advance online publication. doi 10.1007/s11145-016-9627-y

McKeown, D., FitzPatrick, E., & Sandmel, K. (2014). SRSD in practice: Creating a professional development experience for teachers to meet the writing needs of students with EBD. *Behavioral Disorders, 40*, 15.

Nebraska Department of Education (2018). Legislative Bill. Retrieved from: https://nebraskalegislature.gov/FloorDocs/105/PDF/Final/LB1052.pdf

Northwest Evaluation Association (NWEA). (2015). NWEA MAP Assessments. *Portland, OR: NWEA*.

Parker, R. I., Vannest, K. J., & Brown, L. (2009). The improvement rate difference for single case research. *Exceptional Children, 75,* 135–150.

Sanders, S., Losinski, M., Ennis, R. P., White, W., Teagarden, J., & Lane, J. (2019) A meta-analysis of self-regulated strategy development reading interventions to improve the reading comprehension of students with disabilities. *Reading and Writing Quarterly.* DOI: 10.1080/10573569.2018.1545616

Schumaker, J. B., Denton, P. H., & Deshler, D. D. (1984). *The paraphrasing strategy.* Lawrence: University of Kansas.

Tennessee Department of Education. (2017). Dyslexia resource guide. Retrieved from https://www.tn.gov/content/dam/tn/education/special-education/dys/dyslexia_resource_guide.pdf

Youman, M., & Mather, N. (2015). Dyslexia laws in the USA: An update. Annals of Dyslexia, 63, 133-153.