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Response to intervention: Employing a mnemonic-strategy with art media to help struggling writers

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With the implementation of response to intervention (RTI) in many schools across the United States and Canada, many educators have a renewed focus on intervention and assessment programming for students who struggle with academics. One format to manage interventions is for educators to provide these children with mnemonic-strategy instruction. In this study, mixed methods included experimental design, participatory action research, and arts-based data. Four 4th-grade struggling writers at a pacific-northwestern US school completed a writing-interest survey, learned the Ask, Reflect, Text (ART) story-writing mnemonic strategy which included the use of art, received story content and quality progress-monitoring scores at selected sessions, and completed a final exit interview about the intervention. All four participants improved with content; improving quality was more of a challenge. Results and implications are discussed.

Keywords: response to intervention, struggling writers, mnemonic-strategy instruction

One of the most recent actions of US and Canadian educators and policy makers is the implementation of a new instructional and assessment paradigm for learning disability: *response to intervention* (RTI; Gresham, 2002; IDEA, 2004). This article represents the results of the employment of intervention programming for four struggling writers as an example of how RTI could unfold in schools and classrooms. The project's school site had not yet formally implemented RTI, but the district had begun planning which resulted in implementation during fall 2011. To develop their understanding of RTI and its implementation, the district asked the author to join their RTI-implementation team which offered him the opportunity to explain RTI.

The intent of RTI has two goals (Fuchs, Mock, Morgan, & Young, 2003). First, RTI provides for early and intensive intervention which should: 1) help students who initially struggle but then can improve to grade-level ability, or 2) define which students have low ability and make little or no progress over time (i.e., referred to as a child's having a *dual discrepancy*) and should be considered for learning-disability classification. Second, general and special education teachers need to interact and collaborate more in addressing the needs of students—i.e., that general education teachers become more involved in the instructional processes of students' intervention programming and assessment practices (Lyon, Fletcher, Shaywitz, Shaywitz, Torgensen, Wood, Schulte, & Olson, 2001).

The RTI paradigm consists of three tiers (Haager, Klingner, & Vaughn, 2007; Jimerson, Burns, & VanDerHeyden, 2007). Tier 1 (primary tier) has teachers provide research-based general education programming which helps 80% or more of students demonstrate grade-level ability. Three times per year, the whole class completes short assessments known as *universal screening*. If less than 80% of students demonstrate mastery, then changes in curriculum, professional development for the teacher, or both should be considered. Children who score in the bottom 25% in these assessments receive tier 2 (secondary) tier instruction from the teacher or an assistant in either publisher-created (e.g., writing components of READ 180; Scholastic, n.d.) or teacher-developed interventions. As intervention programming progresses over time (e.g., in small groups of 1-4 children, 8-12 weeks, 30 minutes per day), the teacher has the children complete periodic assessments once or twice per week to ascertain any change in students' ability. These progress-monitoring assessments would consist of using curriculum materials that are employed in the intervention's day-to-day activities.

At the end of an intervention phase, the teacher would then review the data with other teacher colleagues for reflection and input. If the data indicated sufficient improvement (e.g., three or more data points/scores above the pre-intervention level), the student may return to general education programming. If the student did not improve, the team of teachers could suggest the third tier (tertiary level) of RTI's structure as either: offering the child more intensive intervention sessions (e.g., smaller group, more time, or both), an alternate intervention, or initiate the process for special education classification and long-term remedial programming.

The Difficulties that Struggling Writers Experience

Of the three core academic skills, writing may be considered the most challenging. In the most recent National Assessment of Education Progress (2007) results for writing, about 40% of US fourth-grade children, for example, could not write at a basic level; scores were even lower for students from diverse backgrounds. This suggests that many students find writing to be a challenge. Not only does a writer have to produce text through idea generation, spelling, and composing, but there is also editing via re-reading and decoding the first draft, knowing which corrections to make, and then completing subsequent drafts to produce a publishable final copy (Berninger, Richards, Stock, Abbott, Trivedi, Altemeier, et al., 2007; Donovan & Smolkin, 2006; Hayes & Flower, 1980; Dockrell, Lindsay, Connelly, & Mackie, 2007; Saddler, Behforooz, & Asaro, 2008; Polloway, Patton, & Serna, 2005; Shanahan, 2006). These students often have difficulty to *self-regulate* (e.g., successfully self-manage writing tasks) as they set goals, monitor performance, self-instruct, and self-reinforce (Harris, Graham, & Mason, 2003).

Other factors too can complicate the writing process for children. Many struggling writers may also have inattention or hyperactivity difficulties making it a challenge to stay focused on a task; about 5% of children in US schools have attention deficit/hyperactivity disorder (Vital Health Statistics, 2008). Many struggling writers often also have difficulty with reading which makes the writing process more of a challenge (Shaywitz, 2003). The physiological and cognitive aspects of writing can also pose challenges (Kellogg, 1994). Struggling writers often have difficulty with the visual-motor integration process—i.e., the brain's management of the arm, hands, and fingers in directing the writing tool to produce text on paper. Offering these students a mnemonic strategy where they could illustrate their own story ideas could help them evade the need to write in the story-planning phase and use their image-based plan (e.g., an example type of external memory) to generate more elaborate text in their final copy (Polloway, Patton, & Serna, 2005).

Addressing the Needs of Struggling Writers: Mnemonic-Strategy Instruction

Researchers (Graham & Perrin, 2007a, 2007b; Swanson, Hoskyn, & Lee, 1999) have concluded from their meta-analyses that one of the most effective means to address the needs of students who struggle with writing is mnemonic-strategy instruction. A step-by-step process for story writing provides students with a means to initiate, monitor, and complete the stages of composing a text. Graham, Harris, MacArthur, and Schwartz (1991) created self-regulated strategy development (SRSD) for this purpose: 1) discuss it - review current writing performance, explain how the mnemonic strategy can benefit them, and have the students commit to learning the mnemonic strategy; 2) model it - teach the mnemonic strategy with multiple examples; 3) memorize it - have the students demonstrate memorization of the mnemonic-strategy's components; 4) support it - offer guided practice where the students increasingly participate in applying the mnemonic strategy; and 5) independent performance where the students use the mnemonic strategy on their own and apply it to similar tasks in other academic activities. Struggling writers may improve during intensive intervention as their teachers apply a mnemonic strategy using SRSD's components.

Ask, Reflect, Text (ART): A Story-Writing Mnemonic Strategy

Author and Finley (2008, 2010; author, 2011) developed a mnemonic strategy to address motor-integration challenges. Based on Calkins (1986) and Graves' (1983) writers workshop as well as Ernst (1993) and Olshanky's (1994) artists' workshop, the Ask, Reflect, Text (ART) mnemonic strategy included three steps: 1) students *Asked* themselves the WWW, W=2, H=2 cue questions (Graham & Harris, 1989) to begin thinking of what they would like to include in their story's topic; 2) as students *Reflected* on their answers, they illustrated their ideas with art media such as markers, watercolor paints, or play dough; and 3) students then used their aesthetic story plan to generate sentences for their story's *Text*. "Putting ideas into the form of graphic representations allows the children to understand that their actions can communicate. This is an extraordinary discovery for young children because it helps them to realize that in order to communicate, there is a tool to communicate much simpler than words" (Malaguzzi, 1998).

Author and Finley's (2008, 2010) projects focused on first- to eighth-grade who were almost all average to proficient writers. The author's (2011) project focused on second-grade students who struggled with writing. This study's topic focused on how struggling writers in fourth grade changed in their ability after applying ART. The research questions addressed in this study were: 1) how did the fourth-grade participants' perceive writing and their ability prior to the intervention beginning? 2) what change in story-writing content (i.e., answers to the WWW, W=2, H=2 cue questions) would result from struggling writers' employment of the ART mnemonic strategy? 3) as a secondary (comparison) variable, how would struggling writers' story quality change as they apply the ART mnemonic strategy? 4) would the use of art media during planning result in as good or better scores for story content and quality? 5) what were participants' thoughts about ART, its possible uses for writing tasks other than story writing, and what they would change about the mnemonic strategy, if anything?

Methods

The purpose of the project was to investigate struggling writers' change in story-writing ability by illustrating their story plan. The processes of this study incorporated planning a change (i.e., improving story-writing skills), observing and participating in the process as well as the results of the change, reviewing the processes and results, and then reinitiating the planning, acting, and reflection cycle (Erickson, 1986; Hendricks, 2006; Kemmis & McTaggart, 2000). How students used the Ask, Reflect, Text mnemonic strategy prompted the action of the research.

The author employed a mixed-methods design. To assess each child's qualitative perspectives about writing and how they felt the ART mnemonic strategy helped them improve, each child completed a pre-intervention survey (Rhodes, 1993) and post-intervention interview. To monitor the children's quantitative change in story content and quality over time, participants completed periodic progress-monitoring probes (i.e., write a story about a simple cartoon picture). This quantitative component included a single case design (Kennedy, 2005) format where participants each first demonstrate writing ability, then receive training in a strategy, and finally demonstrate a change in ability having learned the strategy. This mixed-methods approach provided for a means to compare a child's scores between phases and contrast different students at each phase as well as attain their verbal perspectives about the study's topic and procedures.

Setting and Participant Profiles

The study took place at a suburban elementary school in a northwestern US state during October and November of 2009. The racial demographics for the school were as follows: 0.7% American Indian/Alaskan Native, 5.0% Asian, 1.9% Pacific Islander, 6.9% Asian/Pacific Islander, 2.3% Black, 9.6% Hispanic, and 74.7% White. A total of 55.8% of the student population participated in the school's free or reduced lunch program.

To identify potential fourth-grade candidates for the Ask, Reflect, Text (ART) mnemonic strategy project, the author and applicable teaching personnel considered struggling writers who had no known disabilities. The fourth-grade teachers conducted a universal screening assessment for writing where all students in both classes were asked to write a story about a cartoon picture prompt. In previous studies (Graham, Harris, & Mason, 2005; Saddler, Moran, Graham, & Harris, 2004; Harris, Graham, & Mason, 2006), students had identified these pictures to be topics from which they could generate text for a story. The teachers then collected the stories and reviewed them in preparation for discussion with the author.

At the follow-up meeting, we reviewed the results and developed a list of appropriate student participants—those who had not created a story plan nor provided a story for a simple cartoon picture. The resulting four 4th-grade students constituted the sample for the study. Two participants were White, and two were of Hispanic descent. Both Hispanic students' teachers commented that these children had native-like fluency. Also, their having an Hispanic background invoked the district's policy of providing five to seven years of exposure to English before considering special education assessment and referral (Cummins, 2000). The teachers phoned the parents/guardians to explain the intended benefits for their child as participants in the project; following verbal consent, parents/guardians' consent and students' assent forms provided the written approvals for instruction to begin.

To help with intervention programming, the author had attained funding from a local foundation which had no financial interest in writing, per se. The funds provided for the hiring of a recent university student graduate with an interest in education (hereafter referred to as the *intervention specialist*). She had performed this role in two other similar writing projects using ART during the previous school year. The author trained her in this project's components and processes during two half-day sessions.

General Instructional Procedures

Participants met individually with the intervention specialist in the media center (i.e., corner of the library) for each session. Prior to session one, the intervention specialist had each student complete a writing-interest inventory (Rhodes, 1993). The author then randomly assigned participants to be either first, second, third, or fourth to receive ART training as each student was considered as a struggling writer. The project's 25-session timeline then begun with the first of a series of five phases (A-E).

Phase A: *Baseline*. The purpose of phase A was to ascertain each student's story-writing ability over time and initiate writing-skills practice (but not story writing, specifically, in this phase). During the first 20 minutes of each session consisted of: reading and discussing a story, practicing spelling words from the story, combining two simple sentences into one based on the short phrases that the intervention specialist provided, and creating elaborate phrases (e.g., using conjunctions, adjectives, adverbs) about an image from a picture book. In the remaining 25 minutes, participants wrote connected text after selecting from a long list of choice activities such as writing the directions to find a place/landmark or a recipe for making a meal—the choices did not specifically involve writing a story.

During the last 25 minutes of selected sessions, participants completed progress-monitoring story writing probes (i.e., write a story about a black and white cartoon picture) to assess their ability for content and quality as well as change in these skills over time. In phase A, the intervention specialist directed the students to write a story using any strategy(ies) that they had previously learned and did not provide help with spelling or sentence creation. Each probe was then given a score (0-7) for: 1) story content as the prime variable of interest (based on a story's answering the seven WWW, W=2, H=2 questions), and 2) quality as a secondary (comparison) variable (based on each student's probe story being compared to an author-created rubric). The author worked with a graduate student in education, who was not part of the project, to score the

stories for content and quality. After scoring each story on our own, we then discussed scores where we disagreed until we attained 100% agreement.

Phase B: *Training*. Following each participant's establishment of a stable baseline of writing-skills performance, the intervention specialist implemented instruction over two sessions in the ART mnemonic strategy using components from the self-regulated strategy development (SRSD; Graham & Harris, 2005) model, as presented earlier. Following the first student's demonstration of improved story content (the focus of ART), the intervention specialist initiated ART mnemonic strategy instruction with the next student. In the remaining days of the study's 25-day timeline, students completed additional cartoon-picture prompts (i.e., probes) to define students' story writing and quality ability. The intervention specialist again did not provide help with spelling or sentence creation during probe assessments.

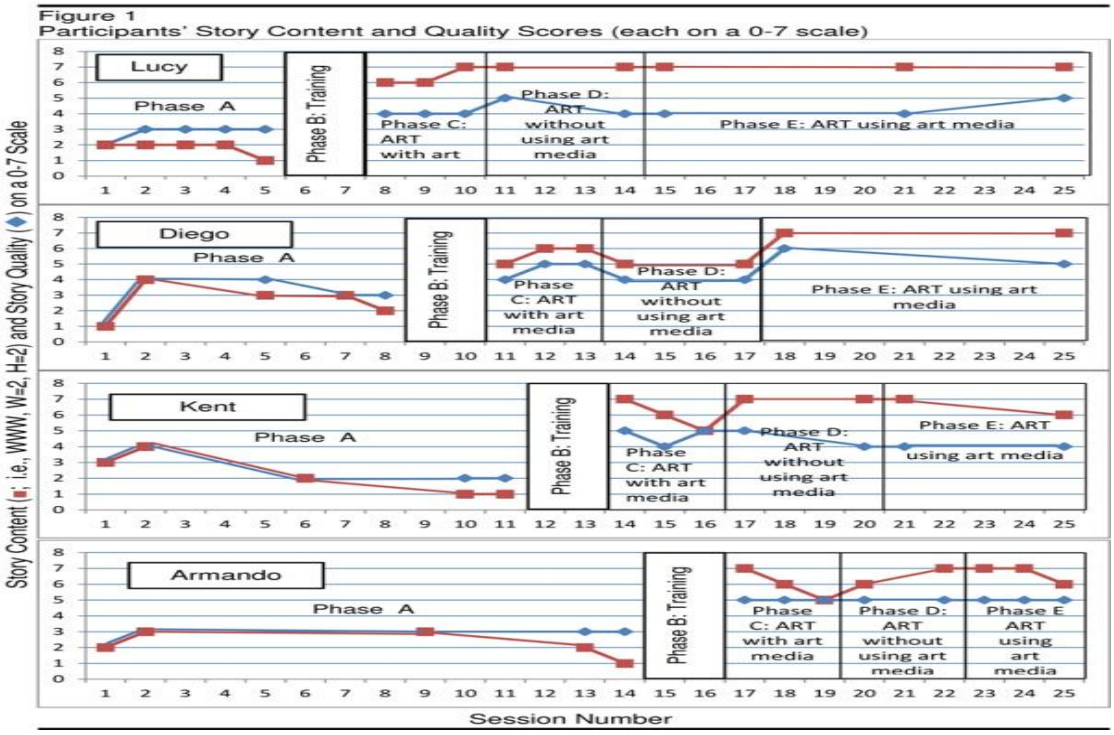
Phases C and E had students employ the ART strategy with art media such as paints, markers, or playdough. To address the research question of whether participants' use of art media (e.g., paints, playdough) would make a difference in story content and/or quality, phase D of the post-training sessions had students only use pencil and paper for *Reflecting* on the WWW, W=2, H=2 cue questions (Graham & Harris, 1989). In the remaining sessions, participants had art media available again for use.

Results

Lucy, Kent, Diego, and Armando's responses to the writing-interest inventory (Rhodes, 1993) indicated that they all liked writing as a task and had topics about which they liked to describe. Each participant named a person whom they identified as a good writer and the practices that the person employed such as reviewing one's text to make edits, adding details, and using longer words. To help address their difficulties with writing, Lucy, Kent, Diego, and Armando each responded that they felt comfortable asking a friend, their teacher, or their parent(s) for help.

Participants' progress with story-writing intervention programming is illustrated in Figure 1.

Figure 1
Participants' Story Content and Quality Scores (each on a 0-7 scale)



In phase A, each student demonstrated a stable or declining trend in story content. Story quality, as a secondary (comparison) variable, had a similar trend except for Lucy. Following the two sessions of training (phase B), all participants improved with story content during phases C and E and had a stable or positive trend. The same was true for story quality except for Kent. Story content and quality did largely parallel each other amongst phases for each child apart from Kent in phases C-E—and Armando in terms of quality.

In phase D, Lucy, Kent, Diego, and Armando did not have access to art media (e.g., paints, playdough) to do their *Reflect* illustration—only pencil and paper. Only Diego demonstrated a unique difference in scores during phase D as compared to C and E; his story content and quality scores each declined by one point, but his first probe's scores for phase E demonstrated his highest score of any to date. The other students' scores or trends in phase D appeared to continue into phase E. Each participants' session 25 story is included in Table 1 to provide an example of each participant's illustration and accompanying text.

Table 1
Participants' session 25 story illustrations and texts

Lucy		Lucy, her little sister, and mom baked a cake. Lucy and Moriah were little sisters. Cynthia was Lucy's mom. It was in the summer. It is during the day at 4:30. It is at Lucy's house. It is also in the kitchen. Lucy, Moriah, and Cynthia were making a cake. They all took turns mixing. When they had finished making the cake, it had flowers on it. The cake had frosting on it too. They all got cleaned up in the bathroom. Then they all went to bed. They first felt happy because they go to make a cake. They also felt tired because it took a long time to make and cook it. They also put frosting and flowers on it. the next day, they ate the cake.
Diego		One day, I went to the park to play basketball. I made a lot of shots. I played all day. I went home to get some food. The next day, I went back to the park and played some more. I then went home again. I went to my cousin's wrestling match and then went home. I ate and then went to sleep because I felt tired.
Kent		Kathy met an alien. Kathy said, "help me." It is day time. It is summer because it is hot outside. Kathy and the alien are outside. The alien jumped into the shade because it is bright outside. They argued with each other. They argued about what had happened. The alien tackled Kathy. Kathy pushed the alien off of her. Kathy and the alien saved the day.
Armando		Two kids were in the backyard playing soccer. It was on a hot summer day. They were running all over the place. It was the boys and the girls' house. They had a really big backyard. They were kicking the ball back and forth and running everywhere. They heard a noise like something had landed in their front yard. So, the little girl ran to the front. She said, hurry up Jimmy. He ran and tripped. She said, come on, the flying saucer is flying away. it flew away, the boy was upset and very, very curious. Then the boy felt mad and curious. the girl was happy because she never, ever saw a flying saucer in her life. It started to rain so they went inside. They put new clothes on and went on the couch to watch tv. Later at night, the girl went online to saucer.com the boy kept looking to the sky wondering if the flying saucer might return to his house again. their mom asked what they had done today? They said that they had seen a flying saucer. The mom said, you did? Wow! The girl said that Jimmy could not see because I had told him to run. So he ran and tripped.

The author observed the intervention specialists' instructing students during eight sessions across all five phases. To monitor general education classroom instruction and that it not include instruction in ART, the author observed random general education writing classes. Students did not learn or employ anything similar to ART nor use art media. They either wrote stories in small groups of 1-3 children or employed oral discussion as the pre-writing strategy.

In exit interviews (December 3, 2009) which the intervention specialist completed with each participant, Lucy, indicated that she, "liked how the ART [mnemonic] strategy helped in my writing in that the Ask component helped me specify what I needed to write." She also stated that she has used ART in her regular education classwork as well; when her teacher asked students to write a story, she used the ART sequence (WWW, W=2, H=2 cue questions; Graham & Harris, 1989) as though it were a story web. The Reflect aspect too helped Lucy, "use imagery in [her] development of story ideas in class activities." Diego liked it, "because it was fun to do such as first the painting, then writing." He used ART for writing tasks outside of the project as well; "the intervention's spelling-practice component helped me to be a better writer in tasks in class and outside of school." Kent stated that, "ART was fun because the mnemonic strategy offered a way to note ideas to the WWW, W=2, H=2 questions with illustrations and then write them down for later revising. It sometimes took some thought to use the illustration to develop my text, but it worked for me." Kent also mentioned that, "ART could help other children be better writers because it offers a means for planning one's writing." He felt that ART was fine as a mnemonic strategy; it said not need to be changed given its straight-forward three-word sequence.

Armando liked learning and using ART too. "Illustrating helped me produce better writing. With the Reflect component, I could think through the sequence of my story." He also said that ART could help other children given its help with creating ideas through illustrations. "Using more colors helps children have a means to know what steps to do in writing." Armando also felt that ART did not need to have changes; "it helped me a lot, and I like it as it is." Participants' qualitative data reflected how ART was beneficial for them—as demonstrated in their improved quantitative story content and, in most cases, story quality scores during the post-training phases of the project.

Discussion

To address the needs of struggling writers to produce elaborate story content, each participant received intensive programming in the components of writing (e.g., review published writers' texts, reflective discussion about the stories read, spelling practice, and sentence creation/combining activities) as well as the Ask, Reflect, Text mnemonic strategy. The participants' exit interviews as well as their stories' content and quality scores demonstrated that the intervention had at least some positive effects in improving their writing skills.

Participants' Rhodes (1993) survey answers indicated that they had a positive perspective about writing, which was demonstrated in aspects of their resulting texts. Story content scores proved to have the most noticeable change from baseline to intervention phases C-E. The specificity of the WWW, W=2, H=2 cue questions (Graham & Harris, 1989) provided for key words or phrases that could be included in a participant's text. If a student had not provided a needed one-word answer (e.g., who is in the story?) during baseline, the two sessions of training (phase B) would reinforce the need for this type of content to be included, which the child could then do thereafter. ART's focus on story content proved to be an illustrative example of how intensive intervention can help children improve.

Story quality proved to be more of a challenge—even with ongoing regular instruction of reviewing published writers' works, spelling as well as sentence creation and combining practice. These tasks involve a number of skills that happen concurrently such as memory skills for spelling, idea generation, and sentence generation for creating connected text (Berninger et al., 2008; Donovan & Smolkin, 2006; Hayes & Flower, 1980; Lindsay et al., 2007; McCuthchen, 2006; Saddler et al., 2008; Patton, & Serna, 2005; Shanahan, 2006). It may be that more ongoing practice both at school and at home are needed to make additional gains in story quality. Proficient writing typically is a skill that is mastered through continuing review of published authors' works and participating in writing tasks on an ongoing basis (Richardson, 2001; Shaywitz, 2003).

There appeared to be some level of interaction between story content and quality apart from Kent and Armando's phases C-E. Scores for both variables followed a similar pattern. This would illustrate that they often support each other. As the components of a writing task such as story telling are defined as ART did, the quality of the text will also tend to improve.

While all participants demonstrated some level of improvement with story content (and some with content), the fact that each child responded positively to intervention programming would indicate the unlikelihood of a learning disability in these aspects of literacy (Fuchs et al., 2003; Gresham, 2002; Haager et al., 2007; Jimerson et al., 2007; Lyon et al., 2001). A targeted mnemonic strategy for story quality or simply more time may have facilitated more improvement in this skill.

Phase D's non-provision of art media (e.g., paints, playdough) indicated that only Diego demonstrated any noticeable difference given his story content and quality scores. His exit interview data indicated his love for doing art; the removal of art media during phase D could explain his performance during this point in the project's timeline (Danko-McGhee, & Slutsky, 2007). Other participants' negligible change before and after phase D could indicate that even a simple black-and-white visual external memory component to idea generation was sufficient. The process of RTI's intervention programming to address an area(s) of academic weakness so as to evade special education classification proved to be beneficial for these children.

Implications for Practice

The Ask, Reflect, Text mnemonic strategy is a feasible means to address struggling writers' difficulties with story writing in the classroom instructional context for at least three reasons. First, students tend to love doing art. In this author's own experience as a teacher working with struggling writers and other anecdotal comments made by his colleagues in other schools and

districts, these students tended to have an affinity for art. Using an area of strength is a desired means to help a child improve weak skills.

Second, the Ask, Reflect, Text mnemonic strategy had three simple components to its acrostic. There are three key words and they themselves highlight the task involved for each step in the sequence. When mnemonic strategies have many words to their acrostic as well as long phrases that specify what each keyword means or represents, the task of remembering and applying the strategy may require so much mental energy that the child may forget or lose track of what they are to be doing in terms of managing to produce a final product. Even many of the WWW, W=2, H=2 cue questions (Graham & Harris, 1989) could be defined with just one word (e.g., who? when? where?).

Third, the Ask, Reflect, Text mnemonic strategy was cost effective. Although there may be a significant numbers of children who can experience difficulties with writing (e.g., National Assessment of Education Progress, 2007), teachers need concise and inexpensive means to teach writing tasks such as story writing so that struggling writers may improve. Given that already-existing basic classroom materials such as pencil and paper (or paints, playdough, and other art media too) were sufficient tools to employ the Ask, Reflect, Text mnemonic strategy, no extra costs were required by the teacher and school.

Limitations and Future Research

With the study's small sample size, generalizing the results to the larger student population should be considered with caution. This study's results support the author's previous findings (2008, 2010), but larger-scale projects would help offer insight about wider implementation of the strategy. A second limitation would be the lack of a widely-accepted definition of a *struggling writer*. The author provided a definition employed in this study, but the larger educational community may have varying definitions.

Future research could explore a longer intervention timeline with the aim of seeing more growth in story quality. A follow-up study could investigate how students' story-writing skills would change if they were not presented with a black-and-white cartoon picture as the probe assessment topic; rather, that the children could choose their own topic. From the author's experience as a teacher for struggling writers, this may present a challenge as these children tend to have difficulty choosing a topic; it depends on the child. Nevertheless, it would be alternative aspect of the study's research design to try.

Author's biographical note

Michael W. Dunn is an associate professor of special education and literacy at Washington State University Vancouver. His research interests include literacy skills/strategies and response to intervention. His current research examines teachers' perspectives and application of response to intervention and how mnemonic-strategy instruction can be applied within RTI.

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