Coupling text structure and self-regulated strategy instruction for ESL primary school students' writing outcomes

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ABSTRACT: Enlightened by the implied potential of coupling text structure knowledge and self-regulated strategies to enhance writing, this study explored the possible effects of a one-month multicomponent intervention combining text structure with self-regulation training on writing. Target participants consisted of 178 primary school sixth-grade students learning English as a second language (ESL). Among them, 45 students received text structure instruction plus self-regulation strategy development (TSI+SRSD), 45 received text structure instruction only (TSI), 45 received SRSD only, and 43 were in a control group. Dependent variables were learners' abilities to summarize main ideas and write essays. As expected, TSI instruction or SRSD instruction resulted in better writing outcomes (i.e., summarizing main ideas and writing essays). This study contributes to research on self-regulated writing development by providing evidence that the TSI+SRSD intervention was particularly effective in enhancing primary school ESL students' abilities to summarize main ideas and write essays. This instructional approach seems promising in ameliorating ESL young learners' writing ability and minimizing struggling writers' compositional difficulties. Relevant implications for language education are also discussed.
Keywords: text structure, self-regulation, writing instruction, essay writing

Acoplamiento de la estructura textual e instrucción de estrategia autorregulada en los resultados de la composición escrita de los estudiantes de primaria de Inglés como segunda lengua

RESUMEN: Motivado por el posible potencial de combinar el conocimiento de la estructura del texto y las estrategias de autorregulación para mejorar la escritura, el presente estudio exploró los posibles efectos de poner en práctica múltiples competencias durante un mes, uniendo la formación en la estructura del texto con el entrenamiento de autorregulación en la escritura. La muestra elegida fueron 178 estudiantes de sexto grado de primaria de inglés como segundo idioma (ESL). 45 estudiantes del total recibieron pautas de estructura de texto más intervención de autorregulación (TSI + SRSD), otros 45 estudiantes recibieron solo pautas de estructura de texto (TSI), otro grupo de 45 estudiantes recibieron solo autorregulación (SRSD) y 43 estudiantes formaban el grupo de control. Las variables dependientes fueron la capacidad de los alumnos para resumir las ideas principales y escribir ensayos. Como se esperaba, la enseñanza de la instrucción TSI o SRSD arrojó en un mejor resultado en la escritura, es decir, a la hora de resumir las ideas principales y en los ensayos escritos. Este estudio contribuye al área del desarrollo de la escritura autorregulada al proporcionar evidencias de que la intervención TSI + SRSD fue particularmente efectiva para mejorar la

capacidad de los estudiantes de ESL de la escuela primaria para resumir ideas principales y escribir ensayos. Este parece ser un enfoque educativo prometedor para mejorar la capacidad de escritura de los estudiantes jóvenes de ESL y minimizar las dificultades de escritura de los aprendices con dificultades. También se discuten las implicaciones para la educación lingüística basada en estos hallazgos.
Palabras clave: estructura de texto, autorregulación, enseñanza de escritura, calidad de escritura

1. Introduction

English as a second language (ESL) students can experience writing-related challenges (Nation, 2008). The present study considered the effectiveness of writing outcomes, operationalized as students' abilities to summarize main ideas and write essays. However, these tasks may be difficult for primary school ESL learners, who have been found to often ignore the roles of planning, organizing, monitoring, and evaluation in writing (Teng, 2019). A lack of self-regulation may explain why student writers tend to find the composition process challenging, particularly when organizing and putting ideas into words or otherwise executing self-regulatory mechanisms to better control the writing process (Graham, Harris, & Mason, 2005). Recent research has highlighted learners' need to acquire metacognitive training; areas of note include instructing learners how to plan goals, monitoring their writing progress, examining writing performance, and reflecting on inherent problems in their writing (Teng, 2020). In an ESL writing context, learners' abilities to transform their ideas into compositions and to devote effort to planning, monitoring, and evaluating the writing process by using metacognitive strategies are thus important (Reutzel, 2015; Teng & Huang, 2019).

However, studies about facilitating ESL young learners' self-regulated writing strategies are scarce. Recent research (Teng & Huang, 2019) has pointed to the value of investigating these learners' self-regulatory characteristics. ESL young learners have also been identified as needing more support than other student groups in terms of self-regulating their writing process (Pinter, 2017). As these learners endeavor to meet writing requirements, instruction on self-regulated strategies may facilitate cognitive processes underlying writing to uncover features that may help young learners plan, evaluate, manage, and develop their writing performance.

Most classroom-based research to date has also addressed the need to foster self-regulated strategy development among learners (e.g., Teng, 2016; Harris & Graham, 2013; Mason & Shriner, 2008). Even so, the current body of literature reveals several important gaps. First, studies have not considered the use of online courses in teaching self-regulated strategies or text structure knowledge. The lagging use of online technology is not consistent with ongoing technological advances in modern society. Second, although Teng (2019) compared the effectiveness of text structure knowledge and self-regulated writing strategies on writing and noted the potential of incorporating both types of instruction, scholars have not yet evaluated the potential of multicomponent training (Reynolds & Perin, 2009). Third, writing has become progressively challenging for primary school learners, as they may lack text structure knowledge to explore embedded meaning in a text (Altemeier, Jones, Abbott, & Berninger, 2010). It therefore becomes essential to evaluate whether such training can help learners synthesize information to enhance their writing, particularly among primary

school young learners. The purpose of this study was to conduct a closer examination of the extent to which the interplay of text structure knowledge and self-regulated strategy development may lead to desired student writing outcomes (i.e., success in summarizing main ideas and writing essays).

2. The Effects Of Text Structure Instruction (TSI) On Writing

Text structure involves a text's overall organization, including the physical layout and typographical cues that can be used to understand a text. Cognitive schemas may help learners discern the meaning of a text, which may scaffold them to keep text information in mind (Welie, Schoonen, & Kuiken, 2017). Reynolds and Perin (2009) demonstrated the potential of text structure knowledge in writing. Their study involved two experimental groups, one receiving text structure knowledge instruction and another receiving self-regulated strategy development (SRSD). Results showed that both groups performed better on writing assignments than a control group. In another study, Kirkpatrick and Klein (2009) considered 7th- and 8th-grade students. The experimental group focused on students' knowledge of compare–contrast text structure. Learners in the experimental group made far greater gains in writing than students in the control group, who did not receive text structure training. More recently, Teng (2019) found that text structure knowledge could help ESL young learners organize, compare, and build richer connections with their background knowledge, thus enhancing writing performance.

Based on the above-reviewed studies, understanding how text is structured facilitates reading and in turn supports writing. A key strategy involves using graphic organizers to visually represent information, which can help learners understand how text is structured. However, the writing-related benefits that primary school students accrue from text structure instruction (TSI) have not received sufficient attention.

3. The Effects of Self-Regulated Strategy Development (SRSD) on Writing

Zimmerman and Risemberg (1997) defined skilled writing as the dynamic articulation and sustained management of individual factors (cognitive processes, motivation/affect, long-term memory, and working memory) and writing task characteristics; this process requires "multifaceted self-regulation" (p. 76). SRSD can thus be defined as the development of "cognitive processes and motivational beliefs related to writing (covert self-regulation), the writing-related motoric activities (behavioral self-regulation), and the social and physical setting where writing takes place (environmental self-regulation)" (Limpo & Alves, 2018, p. 383) or "the schema of planning, monitoring, and evaluating as a guide to encode information, prompt knowledge and transfer skills for subsequent writing" (Teng, 2019, p. 291). SRSD highlights the development of learners' background knowledge, establishment of self-regulated writing strategies through teacher modeling, guided and supported practice, and independent strategy performance (Harris & Graham, 1992; Reutzel, 2015). SRSD was developed through psychology research on self-regulated learning (Zimmerman, 1990), highlighting that language learning can be guided by metacognition (e.g., an ability to become

aware of and take control of one's thought processes) (Teng, 2016), strategic action (e.g., planning, monitoring, and evaluating personal progress) (Teng, 2017), and motivation to learn (Man, Bui, & Teng, 2018).

Researchers have noted several effects of SRSD instruction on writing. Six 5th- and 6th-grade students were involved in an early study (Sexton, Harris, & Graham, 1998). The students received a three-step (think, plan, and write) strategy for writing. Results showed that SRSD helped learners develop topic sentences, identify reasons that supported their premise in greater detail, explore the soundness of an argument, and more effectively conclude a written product. Tracy, Reid, and Graham (2009) divided 123 third-grade students into two groups: one group received instructions on planning and regulation of writing strategies, writing process, writing behavior, and knowledge about the purposes and characteristics of good writing; the other received traditional writing instruction. Results indicated that the group of students who received SRSD instruction could write longer, schematically stronger, and qualitatively better stories. Teng (2019) explored two experimental groups in an ESL context: a text structure knowledge group and self-regulated strategy group. Findings showed text structure knowledge to be beneficial in enhancing learners' ability to summarize main ideas, while instruction of self-regulated strategies was beneficial for essay writing. Overall, the instruction of SRSD strategies (e.g., planning, drafting, organizing, revising, and evaluating, or some combination thereof) appears to help learners improve their writing.

4. The Complementary Relationship Between TSI and SRSD

As argued by Teng (2019), writing requires the instruction and execution of text structure knowledge (Robinson & Kiewra, 1995) and self-regulated strategies (Graham, Harris, & Mason, 2005). For example, in an early study (Englert & Marriage, 1991), instruction about text structure (e.g., predicting, organizing, presenting details, searching, summarizing, cause and effect, and evaluating) was found to help fourth- and fifth-grade students perform better on a free-recall writing task. To further facilitate writing performance, self-regulatory ability has been noted to promote the effectiveness of text structure on writing. Reynolds and Perin (2009) similarly suggested that there may be value to incorporating text structure and self-regulated strategies to maximize writing.

Writing is a cognitively demanding activity, such that the various processes involved in writing may complicate the act of composition (Hayes, 1996). Teng (2020) proposed a complementary relationship between text structure and self-regulated strategies, arguing that young learners' writing may be better enhanced by coupling self-regulation strategies and text structure. For example, self-regulation allows for effective management of writing processes to promote essay writing, while text structure enables effortless transformation of structures into a hierarchical organization of text information that can be helpful for summarizing main ideas. Therefore, writing performance is determined by the development of text structure knowledge and the fostering of self-regulation capabilities. Nevertheless, self-regulation and text structure have been studied independently in previous studies, highlighting the potential of exploring the possible benefits of combining TSI and SRSD on writing performance.

5. THE STUDY

The purpose of this study is to compare the effectiveness of TSI and SRSD, individually and combined, on ESL writing outcomes. Learners receiving the two training programs were compared with students learning about text structure only, self-regulation only, and students in a control group. The study focused on primary school ESL learners, a group who has been relatively under-researched in previous studies. The present study scrutinized instructional effects via a comprehensive set of measures, including summarization of main ideas and essay writing. This study explored two research questions:

1. To what extent does the summary of main ideas differ between the four conditions (TSI+SRSD, TSI, SRSD, and CG)?
2. To what extent does essay-writing performance differ between the four conditions (TSI+SRSD, TSI, SRSD, and CG)?

6. METHOD

6.1. Participants

Participants included 178 sixth-grade students from four primary schools in Hong Kong. Participants received a standard English exam for primary schools in Hong Kong prior to the experiment. Each school hosted about 100 sixth-grade students. About 50 to 60 students scored 60–70 points (out of 100) on the English exam, placing them at an intermediate level according to their teachers. A large proportion of students had reached this level, hence intermediate proficiency being the focus of this study. Ultimately, 45, 42, 46, and 47 students were respectively recruited from each school with parents' permission. All students were assembled in one school. They were randomly and equally divided into four groups (n = 45). Two students failed to finish all exercises and teaching sessions; their data were thus excluded from analysis. The final dataset included 45, 45, 45, and 43 students per group (see the "Methodological design" section). Four experienced ELT teachers were randomly assigned to oversee one condition.

6.2. Methodological design

The four groups worked on a multimedia writing unit designed by the author. The unit consisted of 20 writing tasks representing different levels of complexity. Training for all groups included 20 one-hour sessions. One session was administered per day, and learners completed one task per session. TSI was incorporated into the first six sessions of the TSI condition, and SRSD was incorporated into the first six sessions of the SRSD condition. TSI and SRSD were both incorporated into the first 12 sessions of the TSI+ SRSD condition. The control group received 20 sessions on completing writing tasks without TSI and/or SRSD. As this course was a multimedia writing unit, all instruction and writing exercises were completed online.

6.3. Text structure instruction (TSI)

Instruction of text structure strategies was adapted from Reynolds and Perin (2009) and Teng (2019). Different from these studies, the instruction in the present study focused on various types of strategies and was conducted through an online course designed by the author (Figure 1). The aim was to foster learners' awareness when reading and taking notes, organizing notes, and synthesizing ideas and details for better written production. The text structure strategy was represented by the mnemonic 'STRUCTURING', which stands for "Scan the passage; Think of structure and the big main idea; Read the paragraphs; Underline the important point of each paragraph; Choose one interesting detail; Take notes using frame; U-Turn (repeat with second passage); Review organization of notes; Introduce with topic sentence; Next point; and Go back and edit" (Reynolds & Perin, 2009, p. 281). Text structure instruction was provided in six sessions. The first session concerned the introduction of structuring knowledge, including the text structure sequence and graphic organizer strategies (i.e., prewriting steps and collecting and organizing notes using a graphic organizer). The second session focused on synthesizing ideas and arguments for writing using a graphic organizer. The third session presented the strategy of comparing and contrasting, which is beneficial when discussing similarities and differences. The fourth session focused on classification and division, which is useful for sorting information into topics and categories. The fifth strategy was locating cause and effect, which can help learners explain a cause and its results. The sixth strategy involved chronology, which requires learners to discuss in order the events that happen in a story.

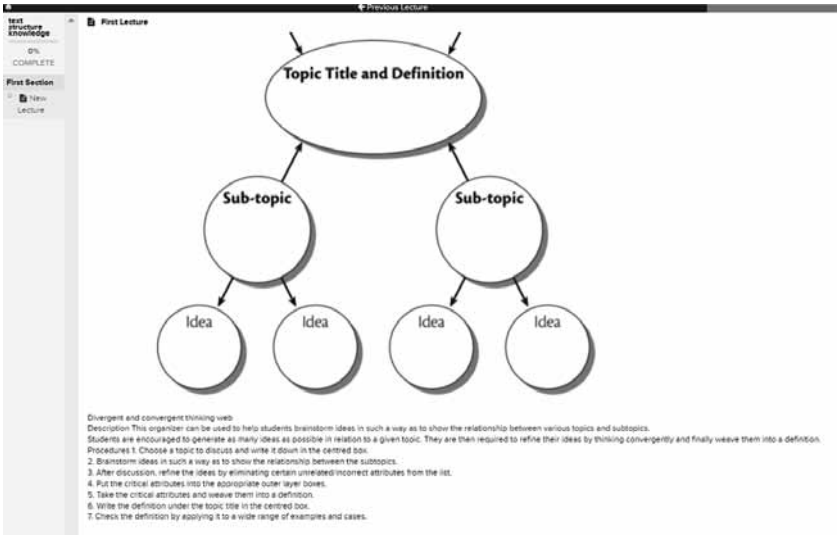

Figure 1. Screenshot of TSI instruction

6.4. Self-regulated strategy development (SRSD)

Instruction of SRSD was adapted from Graham, Harris, and Mason (2005). Different from the previous SRSD model, the present study focused mainly on self-regulation practices in writing, including planning, goal setting, self-monitoring, self-instruction, and self-reinforcement. SRSD instruction was used to familiarize learners with the goals and significance of self-regulation strategies along with the importance of teacher–student interaction (e.g., scaffolding, feedback, and discussion). The ultimate aim is to withdraw the scaffold and guide learners to assume responsibility for recruiting, organizing details and ideas, applying strategies, managing writing, and maximizing writing performance. SRSD instruction occurred online (see Figure 2 for an example). The first session focused on task analysis; for instance, learners were asked to identify the writing task and highlight or underline its key parts. The second session involved goal setting. For example, students were taught that having clear goals can make an assignment easier and improve their writing. Students were also asked to set goals for their writing tasks. The third session focused on task management; learners were asked to make a clear plan about how to accomplish the writing task. The fourth session involved self-evaluation, in which students were given tips about when to stop and evaluate their writing. The fifth session was on self-reinforcement; for instance, students received encouragement after completing a task. The sixth session introduced reflection, wherein students were given prompts (e.g., "Did you achieve the goals you set together? Which strategies worked? Which ones didn't, and why?") to help them reflect on their writing practices.

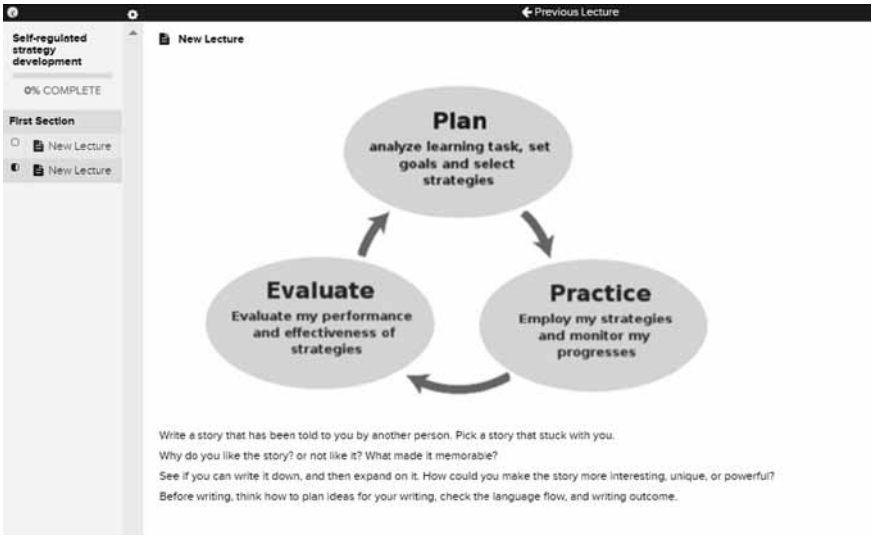

Figure 2. Screenshot of SRSD instruction

6.5. Control group

In this condition, learners were engaged in writing exercises but did not receive any instruction on TSI or SRSD. The teaching procedures in this condition included two parts: in the first, learners completed controlled activities or guided activities; in the second, learners completed a writing task.

Group 1: TSI+SRSD group (n = 45)

In this condition, the first six sessions included TSI and another six sessions included SRSD. The remaining sessions were identical to those taught to Group 4. Materials were printed and distributed to participants in class. They could also use these materials as a reference when completing writing exercises.

Group 2: TSI group (n = 45)

In this condition, the first six sessions included TSI. The remaining sessions were identical to those taught for Group 4. Materials were printed and distributed to participants in class for use during exercises.

Group 3: SRSD group (n = 45)

In this condition, the first six sessions included SRSD instruction. The remaining sessions were identical to those taught for Group 4. Again, materials were printed and distributed to participants in class for use during exercises.

Group 4: Control group (n = 43)

The students in this group learned individually and did not receive any instruction on TSI or SRSD. Learners attended 20 sessions of normal instruction. This condition was used to compare the findings from other groups.

Treatment fidelity

To avoid potentially confusing results due to differences in teacher characteristics, treatment fidelity was ensured through the following procedures. First, the four teachers attended a discussion session administered by the author and an independent trainer who was familiar with TSI and SRSD. This session was intended to familiarize teachers with the teaching schedule, exercises, materials, and purpose of the study. The teachers were informed that to ensure scientific integrity of the research design, they should not discuss their experiences and feelings about the instruction methods with each other until the study was completed. Second, each teacher attended an individual 90-minute session with the author and the trainer to understand the applicable treatment or control condition. During this session, the trainer provided a training package that included lesson scripts and exercises, instructed the teacher on how to carry out the instructional condition, and modeled the use of instruction for the first lesson with scripts and materials. The author also answered teachers' questions as needed, discussed with the teacher and trainer how this instructional method aligned with teaching requirements, and reviewed each scripted lesson together. Finally, to avoid teachers deviating from the pre-determined training procedure, the author randomly observed four sessions per group. The trainer first developed checklists from the lesson scripts. The au-

thor observed whether the teacher followed the procedures. According to the checklists, the teachers in the four groups mostly followed the required procedures. The author and trainer again had discussions with the teachers after each observed lesson for possible refinement.

Measures

Test for summarizing main ideas

This test measured learners' performance in summarizing main information from a text. The learners read a text on the topic 'future life'. They then wrote a summary of the main ideas. This test was measured based on the proportion of main ideas drawn from the source text. The procedures for identifying main ideas followed Perin (2002). Three teachers first worked independently to identify the main ideas from the text. The approval rate on main ideas was 85%. Further discussion sessions were held to compare and resolve differences. The final list of 10 main ideas formed the basis of the score sheet. Scores were given based on written ideas: full summary (2 points), partial summary (1 point), or main ideas not stated at all (0 points). The maximum score for this test was 20 points. The Cronbach's alpha, which was .79, indicated sound reliability for this test.

Test for essay-writing performance

Students' essay-writing performance was measured using an essay on the topic 'my future'. The marking scheme included five components: task response, coherence and cohesion, spelling and punctuation, lexical resources, and grammatical range and accuracy. Following the school's practice, 4 points were assigned to each component. The maximum score for this test was 20 points. Cronbach's alpha, which was .78, supported this test's reliability.

Procedure

This study was completed in one month. The two writing tests served as a pre-test and post-test for the treatment. All tests were in paper-and-pencil format. The time allotted for the written summary and essay was 20 and 40 minutes, respectively. The time was determined based on a pilot study involving 10 students. Two independent raters, who were not teaching the participants, were invited to score the tests. Interrater agreement for the written summary and essay tests was 0.86 and 0.81, respectively. Differences were resolved by inviting a third rater. Final scores were determined through majority opinion.

Data anaylisis

As this study involved four groups, an ANOVA was performed to investigate pre-test differences. A significant correlation was detected between the two writing tests; thus, a MANOVA was carried out for the post-test writing tests. A discriminant analysis was then run to measure the effects of treatment conditions on students' writing achievement; the significance level was set at 0.05.

7. Results

The descriptive statistics of groups' test scores appear in Table 1.

Table 1. Means and standard deviations of test scores in each condition

Measures	Conditions	Pre-test		Post-test	
		M	*SD*	*M*	*SD*
Summarizing main ideas	TSI+SRSD	8.91	.99	15.21	1.13
	TSI	9.09	.87	13.12	1.14
	SRSD	9.02	.81	13.11	1.11
	Control	9.05	.84	10.81	.92
Essay writing	TSI+SRSD	7.02	.81	12.42	1.01
	TSI	6.93	.78	9.73	0.81
	SRSD	6.98	.83	9.84	1.11
	Control	6.88	.85	7.81	.82

Table 1 indicates a slight change in the mean scores on the pre-test, ranging from 8.91 to 9.05 for the pre-test of summarizing main ideas. However, the post-test for summarizing main ideas showed an obvious difference, ranging from 9.01 to 9.11. In terms of essay writing, mean scores on the four conditions ranged from 6.88 to 7.02 on the pre-test and 7.81–12.42 on the post-test.

To explore the differential effects of TSI+SRSD, TSI, SRSD, and CG on students' writing performance, it was first necessary to determine whether significant differences existed between the four groups. One-way ANOVA results showed no significant differences between the groups in the pre-test on summarizing main ideas, $F(3, 174) = .330$, $p = .803$. In addition, there were no significant differences between groups in terms of the pre-test on summarizing main ideas, $F(3, 174) = .330$, $p = .803$. As the four groups did not show significant differences on the pre-test, the next step was to run MANOVA using the two writing tests as dependent variables and the four groups as independent variables.

Based on Box's test of the assumption of the equality of covariance matrices ($p = .095$), the p-value (which exceeded .05) showed that the statistic was non-significant and the MANOVA assumption of homogeneity of variance-covariance was not violated. Hence, the covariance matrices were roughly equal as assumed. We then adopted Wilks' Lambda as the test of the F-statistic in MANOVA to examine main and interaction effects. Results are displayed in Table 2.

Table 2. Multivariate test results

Effect		*Value*	*F*	*Hypothesis df*	*Error df*	*Sig.*	*Partial Eta Squared*
TSI	Wilks' Lambda	.690	192.16	2.000	173.000	.000	.690
SRSD	Wilks' Lambda	.293	208.81	3.000	138.000	.000	.707
SRSD*TSI	Wilks' Lambda	.970	2.71	3.000	138.000	.069	.030

Table 2 indicates a significant effect of TSI [Wilks' Lambda = .690, $F(2, 173) = 192.168$, $p = .000$, $\eta_p^2 = .690$] and SRSD [Wilks' Lambda = .293, $F(3, 138) = 208.812$, $p = .000$, $\eta_p^2 = .707$]. However, results did not show a significant interaction effect of TSI and SRSD on test scores [Wilks' Lambda = .970, $F(3, 138) = 2.716$, $p = .069$, $\eta_p^2 = .030$]. The next step was to report the univariate results (Table 3) (i.e., tests of between-participant effects) to identify the significance of the independent variables on each dependent variable.

Table 3. Results of tests of between-participants effects

Source		*Type III Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*	*Partial Eta Squared*
TSI	Summarizing main ideas	207.380	1	207.380	160.903	.000	.480
	Essay writing	224.910	1	224.910	250.539	.000	.590
SRSD	Summarizing main ideas	220.384	1	220.383	170.992	.000	.496
	Essay writing	247.686	1	247.686	275.911	.000	.613
TSI*SRSD	Summarizing main ideas	.030	1	.030	.023	.880	.000
	Essay writing	4.821	1	4.821	5.370	.022	.030

Table 3 lists the main effects of TSI on summarizing main ideas ($p = .000$, $\eta_p^2 = .480$) and essay writing ($p = .000$, $\eta_p^2 = .590$). Results also revealed the main effects of SRSD on summarizing main ideas ($p = .000$, $\eta_p^2 = .496$) and essay writing ($p = .000$, $\eta_p^2 = .613$). Significant interaction effects of TSI*SRSD were found on essay writing ($p = .022$, $\eta_p^2 = .030$) but not on summarizing main ideas ($p = .880$).

Post-hoc pairwise comparisons indicated that the TSI+SRSD condition yielded significantly better results than the TSI, SRSD, and control group for the three dependent variables (all $p < .001$). Similarly, the TSI condition yielded significantly better results than the control group for the three dependent variables (all $p < .001$). The SRSD condition also yielded significantly better results than the control group for the three dependent variables (all $p < .001$). No significant difference was found between the TSI and SRSD groups in terms of summarizing main ideas ($p = .056$) or essay writing ($p = .571$).

The MANOVA was followed up with discriminant analysis. Results revealed three discriminant functions. The first function (TSI+SRSD) explained 81.6% of the variance (canonical $R^2 = .312$), the second function (TSI) explained 17.2% of the variance (canonical $R^2 = .081$), and the third function (SRSD) explained 21.1% of the variance (canonical $R^2 = .092$). Combined, these discriminant functions significantly differentiated the treatment groups (Wilks' Lambda = .875, $\chi^2 = 18.600$, $p = .001$). Removing the second function did not significantly differentiate the treatments (Wilks' Lambda = .925, $\chi^2 = .621$, $p = .172$), nor did removing the third function (Wilks' Lambda = .936, $\chi^2 = .607$, $p = .435$). Hence, the TSI+SRSD condition significantly affected learners' summaries of main ideas and their essay writing.

8. Discussion

The present study is innovative in evaluating the effects of a multicomponent intervention addressing TSI and SRSD for primary school learners' writing. Learners receiving SRSD instruction coupled with TSI were compared with learners receiving SRSD- or TSI-only instruction and with learners in a control group. Results suggest that TSI and SRSD each led to better performance in the summarization of main ideas and essay writing compared to the control group. The intervention of integrating TSI and SRSD led to the best performance in summarizing main ideas and essay writing.

First, in line with previous studies (Graham et al., 2005; Reutzel, 2015; Teng, 2016, 2019, 2020; Teng & Huang, 2019; Tracy et al., 2009), students who were taught SRSD strategies (e.g., planning and monitoring written products, setting goals, managing the writing process, and evaluating essays) demonstrated better scores on summarizing main ideas than those in the control group. Their essay-writing performance was also better. This improvement may be attributable to the explicit teaching of and guided practice in writing-specific and general self-regulated learning strategies. Such strategies might have helped the learners develop strategic competence to activate background knowledge, as they needed to compare previous writing tasks to the current writing task. Such strategies may help them manage key writing processes, thereby enhancing text quality, as suggested by Limpo and Alves (2018). Hence, it is reasonable to argue that SRSD addresses key cognitive, motivational, and behavioral processes that underlie learners' difficulties with writing (Harris & Graham, 2013). As noted in the introduction, student writers, particularly primary school students, experience problems with the composing process, such as organizing ideas, putting ideas into words, and enacting self-regulatory mechanisms to take control of the writing process. In line with this profile, the present study provided evidence that explicit teaching of SRSD-related writing strategies can facilitate young learners' writing performance.

Second, TSI was intended to build text structure knowledge through instructing summarization rules and graphic organizers in the present study; it was expected that TSI would lead to greater pre-post gain than SRSD in summarizing main ideas. In fact, the amount of change was not significant for TSI and SRSD. This expected finding is tied to the significant differences between the TSI and control groups. Instruction of text structure appeared to help learners organize, compare, and build richer connections with their background knowledge or with texts they had read, thus affecting their writing production (Reynolds & Perin, 2009). As argued by Kirkpatrick and Klein (2009), primary school students may

benefit from learning about text structure because identifying texts' structural organization empowers learners to structure their own texts and to produce summaries of main ideas from texts. Such instruction may also help learners build a coherent representation of a text, and the storage of text information can benefit their essay writing.

Third, this study provided evidence regarding the potential of incorporating SRSD with TSI, a possibility highlighted by Teng (2019). It seems likely that TSI+SRSD students summarized more complete main ideas and produced better essays than their peers due to an increase in text structure knowledge automaticity. In line with Teng (2020), coupling TSI with SRSD instruction may allow learners to register more ideas in their writing, to plan for more complete and elaborate writing, and to produce more syntactically accurate sentences. This result suggests that intensive training in text structure knowledge may be needed for primary school students to benefit from SRSD interventions. This finding is meaningful, hinting at the possibility that multicomponent interventions which address core writing processes (e.g., self-regulation and text structure) may be helpful for young student writers.

Despite empirical evidence supporting its potential to enhance students' writing performance, stating that the scaffold of coupling TSI and SRSD for a one-month period is sufficient to encourage students' production of high-quality, interesting, and meaningful texts would be hasty. The data show that primary school students receiving TSI and SRSD achieved a mean score of 15.21 and 12.42 for summarizing ideas and essay writing, respectively. The maximum score on these tests was 20; although students demonstrated higher scores when summarizing main ideas, they still seemed to struggle to write strong essays in English. The following reasons may explain this unexpected result: (a) primary school ESL students might have been able to summarize main ideas based on reading materials but still lacked free-writing skills; (b) text structure knowledge and self-regulated strategies may depend on other, language-independent skills (e.g., motivational processes) through which writing performance can be maximized; and (c) primary school ESL students may possess limited working memory capacity, such as limited linguistic knowledge or language proficiency, which can be applied in the execution of writing. More studies are needed for a deeper investigation of these issues.

9. Concluding Remarks

The present study, which examined coupling SRSD and TSI instruction, presented improvements in writing-related measures (i.e., summarizing main ideas and writing quality). Results revealed that combining SRSD instruction with TSI training produced an incremental effect on primary school ESL learners' summaries of main ideas and writing quality. Given its effectiveness, this multicomponent intervention was deemed a promising tool to support elementary school ESL learners' writing.

This study is not without limitations. First, the intervention was administered by four instructors; although attempts were made to control for teacher effects through randomized-controlled trials, teacher characteristics may have produced confounding results. Second, due to the difficulties associated with accessing elementary schools, a limited number of participants were included in each group. Further intervention studies should be conducted with larger samples to detect intervention effects. Third, future studies should be performed with

control over more variables (e.g., learners' motivational processes, working memory, strategic behavior, pre-intervention beliefs, and experiences with similar interventions). Finally, writing assessment is a multidimensional process. More tests, such as those involving different writing lengths or written recall, may be needed to explore writing performance more thoroughly.

Despite these limitations, training involving coupling TSI and SRSD, as explored in this study, breaks new ground in writing instruction for primary school ESL learners. This type of training may attenuate challenges in summarizing main ideas for primary school ESL learners with intermediate language proficiency while reducing the difficulty of primary school ESL writing. There are several implications for language education based on these findings. First, the present study provided procedures for classroom practitioners to better understand how to incorporate SRSD and TSI instruction. For example, the structure of organizing TSI and SRSD by creating online courses could be helpful for ESL teachers. Teachers can model and follow these steps to create their own online courses through certain websites, such as *Teachable*. Second, the findings suggest that instruction in text structure and self-regulated writing strategies should be an integral part of teaching writing and should be incorporated in learning-to-write activities. Future writing lessons should be process-oriented, and it would be useful to integrate TSI and SRSD into primary school ESL writing pedagogy. Finally, the findings make an important contribution to the knowledge base around primary school students' cognitive and metacognitive needs during writing. The literature highlights the development of self-regulation as a dynamic and complex process. An understanding of text structure knowledge may help learners better regulate their writing. Such implications are meaningful for curriculum developers and ESL writing researchers.

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