Title	Socio-cognitive approach to teaching writing: Impact on pupils' compositions
Author(s)	Cheung Yin Ling, Ng Chiew Hong and Lim Ching-Tse Donna

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EDUCATION RESEARCH FUNDING PROGRAMME

PROJECT CLOSURE REPORT

Socio-cognitive approach to teaching writing: Impact on pupils' compositions

By

Cheung Yin Ling, Ng Chiew Hong, Lim Ching-Tse Donna

National Institute of Education
Singapore

EXECUTIVE SUMMARY

INTRODUCTION/BACKGROUND

Despite positive findings and movements toward developing writing intervention programmes based on socio-cognitive approach, and the evident necessity of remedial assistance for underachieving writers, to the best of our knowledge, there is no published study of such writing programme for implementation in primary schools in Singapore (Graham, Harris, & Mason, 2005; Harris & Graham, 1992, 1996; Lane, Graham, Harris, Little, Sandmel, & Brindle, 2010). The integration of social and cognitive theory was achieved through explicit teaching of (i) cognitive writing process (Bereiter & Scardamalia, 1987), (ii) modelling of thinking process (Flower, 1994), and (iii) genre-based approach (Martin, 1997) to consider audience and purpose of writing. Besides, previous research has also identified several issues concerning the lack of practice of socio-cognitive approach in writing instructions in schools. Firstly, it has been pointed out that the official curriculum has not been enacted as intended due to the pressure from high-stakes examinations such as the Primary School Leaving Examination (PSLE), as well as the lack of teachers' firm knowledge regarding the curriculum changes (Chandrasegaran, 2013; Kramer-Dahl, 2008; Teo & Kramer-Dahl, 2011). As a result, socio-cognitive approach was not seen as a method that would assure successful performance of students in writing classrooms and in high-stakes examinations. Secondly, the integrated socio-cognitive approach of writing is still under-researched in Singapore (Chandrasegaran & Yeo, 2006; Chandrasegaran, 2013). To date, only narrative (Chandrasegaran & Yeo, 2006) and expository essay (Chandrasegaran, 2013) have been examined at the secondary school level, and hence the gap in research in the application of socio-cognitive approach in narrative writing instruction at the primary school level.

STATEMENT OF PROBLEMS

Most of the existing studies on academic writing were conducted in ESL/EFL university settings. Further research targeted at primary schools, in non-ESL-EFL contexts, will advance broadly our understanding of how students write in early development. This study filled the research gap identified. It examined the quality of compositions produced by students under traditional teaching methods versus an intervention programme based on a socio-cognitive approach to writing.

PURPOSE OF STUDY

This study aims to (1) understand how primary school teachers in Singapore teach writing using traditional methods; and (2) investigate any differences in the quality of compositions produced by students under the traditional methods and a method based on a socio-cognitive approach to writing. Through class observations and in-depth analysis of pupils' compositions, the study sought to explain the impact of the writing programme on the quality of writing produced by the low progress students.

PARTICIPANTS

Participants included 144 Primary Four pupils and 11 English language teachers from a primary school. Eleven classes (control and experimental groups) were involved in total. The teachers have been in service from five to twenty-five years.

METHODOLOGY / DESIGN

A quasi-experimental study design has been adopted. At the beginning of each academic year in January, students who were underachievers in the English language were selected

based on the school's regulation and students' English competence by their respective form teacher to participate in the socio-cognitive writing programme as the experimental group. As the underachieving students were selected from classes of different academic abilities, the experimental group was further divided into three proficiency groups, namely Experimental 1, 2, and 3. Underachieving students of lower academic abilities were assigned to the Experimental 1 group. Underachieving students of relatively mid academic abilities were assigned to the Experimental 2 group. Underachieving students of relatively higher academic abilities were assigned to the Experimental 3 group.

Though the experimental group was further subdivided in such manner, treatment for the intervention programme was delivered consistently across both subgroups. Teachers involved in the intervention programme were trained by the researcher before the start of the programme to ensure complete understanding of the objective of delivering the socio-cognitive writing programme, as well as the method of delivery. Teaching materials such as lesson plans and the self-designed graphic organiser were provided to all teachers.

The control group for this research was made up of 43 students from the same primary four classes. They were not enrolled in the intervention programme but writing samples were collected from them during pretest and posttest. Within the control group, the students were also subdivided into three proficiency groups. Students of lower academic abilities classes were assigned to the Control Group 1. Students of mid academic abilities classes were assigned to the Control Group 2. Students of relatively higher academic abilities were assigned to the Control Group 3.

Data collection procedures

i. Pre-writing

A pretest was conducted at the beginning of the research to both control and experimental groups. The format of the pretest was designed to simulate that of the PSLE English Composition Paper, whereby students are instructed to write a composition of at least 120 words based on a given a theme and three pictures. A few examples of the themes provided include honesty, friendship, a surprise, or a challenge.

ii. Intervention programme

The intervention programme was designed to teach writing through the socio-cognitive approach. The integration of social and cognitive theory was achieved through explicit teaching of (i) cognitive writing process (Bereiter & Scardamalia, 1987), (ii) modelling of thinking process (Flower, 1994), and (iii) genre-based approach (Martin, 1997) to consider audience and purpose of writing. In the present study, participants were instructed to follow the process writing stages of planning, organising, writing, and revising (Bereiter & Scardamalia, 1987). The mnemonic chart of 'WWW, WHAT2, and HOW2' questions was adapted from Harris and Graham (1992) to help participants develop thinking process for narrative writing. The 'why' questions were the most important feature in the mnemonic chart as it was believed that by teaching the students to ask themselves the reason for including a particular detail in their composition, they would, through practice, learn to use it as a guide to align their written product with their rhetorical goal.

In the adaptation of the Self-Regulated Strategies Development (SRSD) model, self-assessment was chosen as the self-regulation strategy that participants needed to master. Self-assessment was provided in the form of a checklist for participants to self-assess their process of writing at the end of the planning, writing, and revising phase. Also, genre-based approached was integrated into the current study by instructing participants to set a purpose and audience for each piece of their narrative writing assignments. The procedures of the narrative were adapted from Martin and Rose (2008), as well as Brisk (2015). However, we made some changes not to confuse participants from what they have learned through the school curriculum. The five stages of narrative writing were orientation, events, complication,

resolution, and ending. The thinking process of each stage with relation to genre procedure was modelled by teachers before having students begin their writing.

These abovementioned features are what set the current study apart from previous studies as the emphasis of the intervention programme was placed extensively on the difference in cognitive process before, during, and after the intervention, as opposed to the focusing primarily on the written products.

Before the intervention programme was administered to the participants, a two-hour teacher training session was conducted by the researcher to explain the structure of the programme and to demonstrate how each cognitive process was to be taught, as well as how to incorporate the teaching materials into the intervention programme. More specifically, the researcher stressed on modelling the thinking process of narrative writing through demonstration with some examples of narrative writing topics suitable for primary four level students. By asking the WWW WHAT2 HOW2 and the WHY question, the teachers were shown how to achieve a rhetorical goal and hold the audiences' interest while planning and writing the narrative compositions. This justification of writers' planning, organising, and writing/revising was emphasised as the most important part of the intervention programme. Teaching materials and lesson plans were provided by the researcher, and some teachers' feedback was used to improve the intervention programme.

The actual pedagogical intervention programme consisted of weekly remedial lessons over three weeks. Each lesson lasted 45 minutes. The lessons were conducted by English teachers for their respective classes. In the first lesson, the overall structure of the thinking process of narrative writing was introduced to the participants. The importance of setting a rhetorical goal, audience, and justifying a piece of written text with the 'why' questions was emphasised. Next, a writing topic and three pictures were introduced. The writing topics given were all topics that can be found in the units of the Strategies for English Language Learning and Reading (STELLAR) (2010) curriculum, such as 'my pet', 'a day in the park', and 'at the supermarket'. With the given topic and pictures, teachers first modelled how to set a goal and audience, then demonstrated the thinking process of planning out a story following the five stages of narrative writing: orientation, events, complication, resolution, and ending using the WWW WHAT2 HOW2 and WHY mnemonic chart. At the end of the first lesson, participants were instructed to perform self-assessment to assess the planning with the graphic organiser provided. Participants were told to assess their writing to see if their plans would help them to achieve the rhetorical goal and interest the audience. They were then asked to modify the planning if they were not satisfied with the self-assessment.

In the second and third lessons, teachers first reviewed at the beginning of the lesson the process of setting a rhetorical goal, target audience, as well as the thinking process. Teachers modelled the thinking process of writing (orientation and event) in the second lesson and the rest of the writing procedures (complication, resolution, and ending) in the third lesson based on the planning that they had done in the first lesson. The focus of the teacher' modelling always centred on using the 'why' questions to justify their choice of storyline. After modelling, the participants were then instructed to write their narrative composition. Self-assessments were performed at the end of all three lessons, and the participants were allowed to modify the written products based on their self-assessments. Finally, the participants were then able to complete the narrative composition during the third lesson of the intervention programme based on their revised plan.

iii. Posttest

Posttest was conducted as part of the school examination at the end of the semester (i.e., Term 4 in 2015 and Term 4 in 2016). During the English writing examination, a topic and three pictures were provided. All students were instructed to write a narrative composition using the topic provided and to include at least one of the three pictures in their writing. The duration of the examination was 45 minutes and the students were instructed to

write at least 120 words. The posttest was performed by both control and experimental groups.

Four pieces of compositions – pretest, two pieces of writing during the intervention, and posttest written products – were collected from the experimental group. Two pieces of compositions – pretest and posttest – were collected from the control group. The collected written products were scanned and typed in word processor for the further analysis using computer software.

iv. Class observations

There were class observations (totalling 21 lessons) over a 12-month period. All videos were subsequently transcribed. Field notes of the observations were used to describe the class and contextualise the lessons based on the observation. To analyse the lessons for the mediation process for the socio-cognitive approach to writing, the study uses two of Hyland's principles of writing instruction and Walqui's instructional scaffolding framework.

Data analysis

To determine if the quality of writing of the participants improved after the intervention programme, their pretest, two pieces of writing during the intervention, and posttest written products were holistically and statistically scored and analysed for changes in the four areas of macro-organisation, complexity, productivity, and accuracy. The written products collected were analysed by two expert raters, both of whom have obtained at least a Master degree in Applied Linguistics. For class observation data, there were two stages in the data analysis. For stage 1, all the lessons from the data set of 21 lessons were analysed initially by the first author for the presence of instructional scaffolding functions for the socio-cognitive approach in writing, and then with the second author counterchecking the analysis. For stage 2, as part of descriptive data, two teachers' lessons were analysed in detail for the use of the instructional scaffolding functions and examples from two teachers were used to illustrate the functions in actual classroom practice.

FINDINGS

- Teachers helped pupils learn how to write narratives through instructional scaffolding, which includes elements such as explicit outcomes and expectations, schema building, and development of metacognition.
- The socio-cognitive approach is able to help low progress students in the experimental group improve the macro organisation of story writing.
- In terms of choice of words and command of vocabulary, the experimental group, after the intervention, performed significantly better than the control group.
- Low progress students in the experimental group made fewer technical errors in capitalization, punctuation, and spelling in their post-test writing than those in the control group.

CONTRIBUTIONS

Contributions in terms of practice

- School leaders can further support pupils by:
  a. Extending the duration of the research programme, to allow pupils more practice with forming the required thinking processes under the guidance of their teachers.
  b. Providing more preparation time at the beginning of the programme, so that pupils can practise the task of self-regulation using the WWW WHAT2 HOW2+WHY chart to conceptualise key stages of the writing process.

Contributions in terms of policy and research

- The socio-cognitive approach to writing can be applied to across different levels of studies and different abilities of the students. The study can inform policies that target

low progress students for continual assistance.
- Further research can be conducted to find out how instructional scaffolding functions may be used for different kinds of genres.

CONCLUSION

The present study has investigated how teachers helped primary school students mediate learning on how to write narratives using the socio-cognitive approach through these instructional scaffolding functions: explicit outcomes and expectations, modelling, bridging, contextualizing, schema building, re-presenting text and developing metacognition. While this study echoed the findings of Simeon (2015) in terms of modelling, bridging and contextualizing, the study has extended Simeon's study by investigating all of Walqui's (2006) instructional scaffolding functions by looking at 21 lessons for an overview of usage and specific examples drawn from two teachers' classroom talks. The specific examples from these teachers provides qualitative descriptive data in the domain of pedagogical approaches in writing for primary school students.

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KEYWORDS

Socio-cognitive approach; young learners' writing; primary four; primary school

Socio-Cognitive Approach to Teaching English Language Writing: Impact on Primary School Students Compositions

Cheung Yin Ling, Ng Chiew Hong, Lim Ching-Tse Donna

National Institute of Education

INTRODUCTION/BACKGROUND

The current study aimed to compare the effects of explicit narrative writing instruction through the socio-cognitive approach by identifying and understanding how it may impact the quality of writing produced by underachievers in a primary school. The teaching of writing according to the English Language Syllabus of Singapore (2010) was grounded in the integration of the socio-cognitive approach and two other theories. The socio-cognitive approach to teaching writing was based on the integration of genre and cognitive theories, while the emphasis on readers, context, and goal, as well as a gradual diminishment of scaffolding indicated that the Syllabus was based on genre theory (Martin, 1997). The process of writing (planning, writing, and revising) and learning of writing strategies were grounded in cognitive theory (Bereiter & Scardamalia, 1987).

Despite positive findings and movements toward developing writing intervention programmes based on socio-cognitive approach, and the evident necessity of remedial assistance for underachieving writers, there is no published study of such writing programme for implementation in primary schools in Singapore (Graham, Harris, & Mason, 2005; Harris & Graham, 1992, 1996; Lane, Graham, Harris, Little, Sandmel, & Brindle, 2010). Besides, previous research has also identified several issues concerning the lack of practice of socio-cognitive approach in writing instructions in schools. Firstly, it has been pointed out that the official curriculum has not been enacted as intended due to the pressure from high-stakes examinations such as the PSLE, as well as the lack of teachers' firm knowledge regarding the curriculum changes (Chandrasegaran, 2013; Kramer-Dahl, 2008; Teo & Kramer-Dahl, 2011). As a result, socio-cognitive approach was not seen as a method that would assure successful performance of students in writing classrooms and in high-stakes examinations. Secondly, the integrated socio-cognitive approach of writing is still under-researched in Singapore (Chandrasegaran & Yeo, 2006; Chandrasegaran, 2013). To date, only narrative (Chandrasegaran &

Yeo, 2006) and expository essay (Chandrasegaran, 2013) have been examined at the secondary school level, and hence the gap in research in the application of socio-cognitive approach in narrative writing instruction at the primary school level.

The socio-cognitive approach to teaching writing emerged from two major theories in psychology, the first being Vygotsky's sociocultural theory (Vygotsky, 1980), and the second being Bandura's socio-cognitive theory (Bandura, 1986). Vygotsky's sociocultural theory describes human learning as a social process and the origination of human intelligence in society or culture, whereby the major theme of this theory emphasises on the fundamental role that social interaction plays in the development of cognition. Vygotsky (1980) believed that learning takes place on two levels, first through interaction with others, followed by integration of new knowledge into our mental structure.

In socio-cognitive approach to teaching writing, these two levels of learning are demonstrated through the consideration of the goal and the intended audience of the writers' narrative compositions. One of the main objectives of the writing programme in this current study was to teach student writers the importance of keeping in mind their intended audience and their goal of writing as they planned out their narrative writing using a graphic organiser. By keeping in mind the audience and their goal of writing, the student writers would find it easier to create creative content that would be of interest to their intended audience and thereby achieving the goal of entertaining them.

This integration of cognition and the social aspect of human interaction is also a major theme in Bandura's socio-cognitive theory, which emphasised on the interplay of cognitive, behavioural, and environmental factors in one's learning (Bandura, 1986). In other words, Bandura believes that learners cannot learn without interaction and that likewise, socially constructed knowledge cannot be internalised without appropriate cognitive processes. It is based on this theory that socio-cognitive approach to teaching writing emphasises on keeping in mind the reader and the goal of writing, which is fundamental for any genre of academic writing in any educational setting.

To encompass both the social and cognitive aspects of the socio-cognitive approach and to implement them in writing instructions, the current study incorporated the view of 'writing as a social action' with cognitive apprenticeship (Flower, 1994). More specifically, this study extended the social aspect of interaction by introducing the social purpose of writing considering the audience. It also shifted the purpose of brainstorming from generating ideas for content to helping students externalise thinking processes that took audience and purpose into consideration for their writing tasks.

Another notable model also developed based on social cognitive theory was the Self-Regulated Strategies Development (SRSD) by Harris and Graham (1992). This model was designed to help students with learning disabilities to master the more advanced cognitive processes involved in writing composition, particularly in narrative writing. A growing number of research has shown positive impact on struggling young writers.

A similar integrated view can be seen in Chandrasegaran's study (2013). In her study, Chandrasegaran defined socio-cognitive writing approach as "an explicit teaching of thinking processes underlying the enactment of conventional practices of the genre" (p. 103). It was believed that explicit teaching of thinking process which reflects genre-specific features would improve writing competence (Chandrasegaran, 2013; Chandrasegaran & Yeo, 2006).

In our study, to examine how the writing instruction could be implemented in actual classroom application, we used the adapted instructional scaffolding functions to analyse the mediation process such as how teachers tap on/extend students' existing knowledge or teach students what to attend to. The functions are based mainly on Walqui's (2006) instructional scaffolding framework which Simeon's (2015) study has used to look at the intention and work of the teacher's discourse in teaching writing chiefly in terms of (1) bridging: "sharing personal experiences" and "activating students' prior knowledge"; and (2) modelling. To have a comprehensive picture of the types of instructional scaffolding functions in mediating writing, the present study has used Walqui's six main types of instructional scaffolding:

Modelling: Giving students clear examples of what is requested of them for imitation to complete the writing task and the teacher models "appropriate language use for the performance of specific academic functions" (p. 170). This can be done as a class activity first.

Bridging: Helping students to activate prior knowledge or establish a personal link between students and the subject matter, such as asking students to share personal experiences related to the theme.

Contextualising: Making academic language accessible and engaging for students through using authentic objects, sources of information, realia or analogies based on students' experiences.

Schema Building: Activating students' schema and weaving new information into pre-existing structures of meaning to enable them to accept new connections and to organize knowledge and understanding. Giving general knowledge or the broad picture before studying the details.

Re-presenting Text: Asking students to transform the linguistic constructions of one genre into another genre.

Developing Metacognition: Helping students manage their thinking in terms of strategy application, strategy choice, monitoring, evaluating and adjusting performance during activity; and planning for future writing based on evaluation of performance.

The study has also adopted two of Hyland's principles of writing instruction: (1) Contextualising where writing is "a social activity, supported within familiar routines, or cycles of activity, and by linking new contexts and understandings to what students already know about writing" (p. 152) and (2) Stating outcomes and expectations—where "teachers are explicit about what is being studied, why it is being studied, and what will be expected of students" (p. 152), as part of the instructional scaffolding functions. Goals can influence how learners interpret and use scaffolds in instructional scaffolding. Wood, Bruner, Ross (1976) highlighted teachers' need to clarify learning intentions for students in teaching writing as part of instructional scaffolding.

Walqui's framework is useful for our study as it is enacted through the genre approach regarding modelling, bridging, contextualizing, schema building and re-presenting text. The framework looks at (a) developing metacognition where instructors teach *for* metacognition so students learn to regulate their cognitive activities in terms of knowing *what* the writing strategies are; *how* to use the strategies; *when, where* and *why* to apply the strategies and *how to evaluate* the use of the strategies (Paris & Winograd, 1990; Raphael, Englert, & Kirschner, 1989), and (b) the cognitive processes for writing such as planning: generating ideas, organising, and goal-setting (Flower & Hayes, 1981).

The present study was conducted to fill the gaps in literature by administering a socio-cognitive writing intervention programme to primary four low progress students in Singapore. The purpose of this paper was to investigate whether the socio-cognitive approach of writing has positive impacts on young learners' quality of writing. In the next section, selected empirical studies related to teaching writing through socio-cognitive approach in aiding struggling students in writing will be reviewed.

Proponents of the socio-cognitive approach postulate that explicit teaching of thinking process which reflects genre-specific features will have an impact on improving writing competence. This was supported by the findings of Chandrasegaran's two studies in which socio-cognitive approach was applied in the teaching of two genres, narratives (Chandrasegaran & Yeo, 2006) and expository (Chandrasegaran, 2013) respectively. In teaching character depiction in narrative writing,

Chandrasegaran and Yeo (2006) found that Secondary Three (i.e., Grade Nine) students in a Singapore school showed an improvement in setting the rhetorical goal. It was found that the consistent explicit teaching of thinking process of matching the rhetorical goal and justification of choice of language helped students write a more goal-directed and genre-specific story, as students were able to use more epithets and ideational tokens while writing a narrative. Based on the positive findings in Chandrasegaran and Yeo (2006), Chandrasegaran (2013) conducted another study to determine the effectiveness of socio-cognitive approach of teaching writing in expository writing for Secondary Three students in Singapore. This study found that students displayed more stance assertion moves and stance support moves in post-instruction essays, which were used as indicators of sound expository essays. It was also noted that through guided class discussion and explicit teaching of cognitive processes in genre writing practices, such instructions were effective in raising students' awareness of the social context of the texts, as well as reader and writer roles. Students improved in discourse moves such as elaborating claims and countering opposing views. Due to the primary emphasis on readers' interest and writer's role in socio-cognitive approach to teaching writing, it can be argued that such positive evidence found in secondary school students in expository writing can be used in support for teaching narrative writing in primary schools in Singapore.

In this sense, the socio-cognitive approach is proposed as an alternative method of teaching narrative writing to primary school students as opposed to the traditional methods, whereby the predominant method of writing instruction follows some form of brainstorming by the teacher, with occasional input from students, which results in a list of ideas in words or phrases that act as aids to help students' narrative writing.

On the other hand, despite the positive findings in the previous studies, the results should be carefully interpreted. Firstly, Chandrasegaran's (2013) study did not have a control group due to the school's curricular schedule and as a result all participants received the same instruction. Therefore, it was not clear whether the improvement demonstrated was due to the intervention programme. Secondly, it should be noted that the Chandrasegaran's (2013) study operated on the assumption that the participants possessed the meta-cognitive ability to control the writing process with instructed genre moves prior to the intervention programme. In that, the participants were assumed to possess the meta-cognitive abilities in choosing an appropriate stance support strategy to achieve their rhetorical goal. It may be argued that participants of the study, whose written English were regarded

as 'generally understandable not always error-free' by the researcher, might not possess the meta-cognitive abilities required to match the genre moves to the rhetorical goal and thus face difficulties in their expository writing prior to explicit modelling of instruction in writing (Glaser & Brunstein, 2007).

To understand the importance of helping students develop cognitive and meta-cognitive strategies to improve in their academic writing, Harris and Graham (1992) advocated that less capable students needed to be instructed cognitive and meta-cognitive strategies explicitly due to their ineffectual ability to acquire those strategies with implicit instruction (p. 284-286). Over the past two decades, Harris, Graham, and Mason developed the Self-Regulated Strategy Development (SRSD) model to help students with learning difficulties improve their writing (Harris et al., 2006). The SRSD model integrates all major learning theories: social cognitive, constructivist, and behavioural. It uses a gradual release of responsibility model, combined with four main characteristics of self-regulated learning (goal setting, self-instruction, self-management and self-reinforcement) to support writers.

Harris and Graham (1996) found that the integrated approach of SRSD showed positive impacts especially for struggling young writers on writing improvements by explicit teaching of genre-specific writing strategies and self-regulated strategies (Graham, Harris, & Mason, 2005). The findings showed that SRSD intervention has positive impacts on helping struggling writers (Glaser & Brunstein, 2007). In the study of Graham, Harris and Mason (2005), participants were divided into three groups: those who received SRSD instruction only; SRSD instruction and peer support; and the control group. Third-grade struggling writers (n = 73) in Washington, DC were asked to write stories and persuasive essays. The findings showed that both SRSD groups improved significantly in the posttest and delayed-posttest. In another study, Sawyer, Graham, and Harris (1992) divided learning-disabled students into four groups, SRSD, SRSD without goal setting and self-monitoring, direct teaching, and the control group, respectively. The data from Normally Achieving students were gathered to constitute a social validation condition. The findings indicated that full SRSD experimental group obtained significantly greater schematic structure scores at generalisation compared to the other three experimental groups. Additionally, comparison with control group shows that SRSD conditions had substantial positive effects.

The current study adopted a few key points from the review of empirical studies of socio-cognitive writing approach. First, explicit teaching of genre-specific thinking process was still

emphasised (Chandrasegaran, 2013), but taking young struggling learners' level of cognitive abilities into consideration, self-regulation was also taught explicitly. To provide students with a form of 'visible thinking process' as emphasised by Collins, Brown and Newman (1987), a specially designed graphic organiser was used as models for cognitive and meta-cognitive thinking process. Second, students were also prompted to consider their writing goal and intended audience on the abovementioned graphic organiser to help them make writing decisions. Third, to simplify the SRSD model for the present study, only one mnemonic chart was used. The 'WWW WHAT2 HOW2' (Harris & Graham, 1996), was selected to reduce time required to teach teachers before the intervention and students during the intervention, as well as reducing pressure, anxiety, and cognitive burden for both teachers and students. Lastly, writing samples were graded not only holistically but also quantitatively using appropriate analytic software. The software not only helped to obtain more accurate information regarding students' writing quality, but also provided valuable statistical evidence on the amount of impact of the socio-cognitive approach amongst different groups of students.

STATEMENT OF PROBLEMS

Academic writing instruction has gone through several phases of evolution since the 1950s, from controlled writing based on Charles Fries' oral approach (Fries, 1955), to Kaplan's theory of the contrastive rhetoric (Kaplan, 1988), to the process approach when researchers began to seek understanding of student writers' thought process and their expression of thoughts in writing. It was not until the past two decades that pedagogical research in academic writing instruction started to inquire into the cognitive and social aspects of the writer while also taking into account the reader, the context, their interaction, and the purpose of writing (Fujieda, 2006). For this reason, the socio-cognitive writing approach is still relatively under-researched in the area of second language writing instruction.

Though research in academic writing instruction has garnered a substantial amount of attention in both ESL and EFL settings over the years, most of the existing studies have been conducted at the secondary or university level, particularly as contrastive rhetoric studies of L1 and L2 writing. In contrast, much less attention has been paid to other educational settings such as primary schools. It

is therefore important to explore how academic writing is taught in primary schools to broaden our understanding of student writing.

Another rationale for understanding the teaching of English academic writing at the primary school level is that previous studies have mainly been examining the effects of explicit writing instruction on primary school students in the genre of argumentative essays. On the contrary, it is narrative writing that has been observed to be the focus of writing instruction in primary schools in Singapore, echoing the genre tested in the annual nationwide standardised examination of Primary School Leaving Exam (PSLE). Hence, with such an emphasis on narrative writing instruction in primary school, there is a call for more research to explore the effects of explicit narrative writing instruction in primary schools in Singapore.

PURPOSE OF STUDY

The present study aimed to address the research gap in the effects of the socio-cognitive approach in writing instructions in primary schools in Singapore. In this sense, the goal of the study was twofold: the first objective was to investigate the effectiveness of the socio-cognitive writing intervention programme on underachieving ESL learners' writing competence based on quality of writing. The second objective was to investigate if such effectiveness varied by language proficiency groups. It is worth noting that the teacher training session conducted as part of the study also contributed to enhancing teachers' knowledge of socio-cognitive writing programme.

The present study addresses the following questions in examining the impacts of socio-cognitive approach to writing for young learners in Singapore:

RQ1: How do Primary Four English language teachers teach their classes in composition?

RQ2: Are there any differences in the compositions produced under the traditional methods and the "socio-cognitive approach to writing" programmes? If so, what are they?

PARTICIPANTS

A total of 144 students from eleven primary four classes of a neighbourhood primary school were enrolled in the socio-cognitive writing programme between January 2016 and December 2017. The eleven primary four classes consisted of five classes from the 2016 academic year and another

six classes from the 2017 academic year. Each year, primary four students were separated into three groups based on their academic abilities in terms of low, mid, and high competence. The classes consisted of students from a mix of all three levels of academic abilities to 'enhance social and personal development', according to a spokesperson from the Ministry of Education as quoted in a news article (Mokhtar, 2017).

Though the medium of instruction in the school was Singapore Standard English, participants mainly used either their mother tongue (Chinese, Malay, or Tamil) or Singapore Colloquial English at home depending on their respective ethnic background. For this reason, the participants in this study are recognised as English as Second Language students.

A quasi-experimental study design has been adopted. At the beginning of each academic year in January, students who were underachievers in the English language were selected based on the school's regulation and students' English competence by their respective form teacher to participate in the socio-cognitive writing programme as the experimental group. As the underachieving students were selected from classes of different academic abilities, the experimental group was further divided into three proficiency groups, namely Experimental 1, 2, and 3. Underachieving students of lower academic abilities were assigned to the Experimental 1 group. Underachieving students of mid academic abilities were assigned to the Experimental 2 group, and underachieving students of relatively higher academic abilities were assigned to the Experimental 3 group.

Though the experimental group was further subdivided in such manner, treatment for the intervention programme was delivered consistently across both subgroups. Teachers involved in the intervention programme were trained by the researcher before the start of the programme to ensure complete understanding of the objective of delivering the socio-cognitive writing programme, as well as the method of delivery. Teaching materials such as lesson plans and the self-designed graphic organiser were provided to all teachers. The 11 teachers have been in service from five to twenty-five years.

The control group for this research consisted of 43 students from the same primary four classes. They were not enrolled in the intervention programme but writing samples were collected from them during pretest and posttest. Within the control group, the students were also subdivided into two proficiency groups. Students of low- and mid-academic abilities classes were assigned to the

Control Group 1 and Group 2 respectively, and students of relatively higher academic abilities were assigned to the Control Group 3.

METHODOLOGY

Data collection procedures

Pre-writing

A pretest was conducted at the beginning of each intervention session. The format of the pretest was designed to simulate that of the PSLE English Composition Paper, whereby students are instructed to write a composition of at least 120 words based on a given a theme and three pictures. A few examples of the themes provided include honesty, friendship, a surprise, or a challenge.

Intervention programme

The intervention programme was designed to teach writing through the socio-cognitive approach. The integration of social and cognitive theory was achieved through explicit teaching of (i) cognitive writing process (Bereiter & Scardamalia, 1987), (ii) modelling of thinking process (Flower, 1994), and (iii) genre-based approach (Martin, 1997) to consider audience and purpose of writing. In the present study, participants were instructed to follow the process writing stages of planning, organising, writing, and revising (Bereiter & Scardamalia, 1987). The mnemonic chart of 'WWW, WHAT2, and HOW2' questions was adapted from Harris and Graham (1992) to help participants develop thinking process for narrative writing. The 'why' questions were the most important feature in the mnemonic chart as it was believed that by teaching the students to ask themselves the reason for including a particular detail in their composition, they would, through practice, learn to use it as a guide to align their written product with their rhetorical goal.

In the adaptation of the SRSD model, self-assessment was chosen as the self-regulation strategy that participants needed to master. Self-assessment was provided in the form of a checklist for participants to self-assess their process of writing at the end of the planning, writing, and revising phase. Also, genre-based approached was integrated into the current study by instructing participants to set a purpose and audience for each piece of their narrative writing assignments. The procedures of the narrative were adapted from Martin and Rose (2008), as well as Brisk (2015). However, we made some changes not to confuse participants from what they have learned through the school

curriculum. The five stages of narrative writing were orientation, events, complication, resolution, and ending. The thinking process of each stage with relation to genre procedure was modelled by teachers before having students begin their writing.

These abovementioned features are what set the current study apart from previous studies as the emphasis of the intervention programme was placed extensively on the difference in cognitive process before, during, and after the intervention, as opposed to the focusing primarily on the written products. The main contents of the intervention programme are summarised in Table 1.

Table 1. *Structure of the socio-cognitive writing intervention programme*

Units	Cognitive processes		Genre practices
1	**Planning:** Setting the purpose and audience of the target text		Purpose and audience of the target text
2	**Organising:** Generating ideas based on the procedures of narrative. WWW WHAT2 HOW2 questions were introduced with connection to stages of genre.		
	WHO is the main character? **WHEN** does the story happen? **WHERE** does the story happen?	WHY	Orientation
	WHAT does the main character do?	WHY	Events
	WHAT is a problem that the main character faced?	WHY	Complication
	HOW is the problem (complication) solved?	WHY	Resolution
	HOW does the story end?	WHY	Ending
3	**Writing/Revising:** Based on planning/organising, students were asked to write a story. Consistent recall of rhetorical goal and audience was performed through 'why' question and self-assessment. Students need to refer to the planning while writing.	WHY	Orientation Events Complication Resolution Ending

Before the intervention programme was administered to the participants, a two-hour teacher training session was conducted by the researcher to explain the structure of the programme and to demonstrate how each cognitive process was to be taught, as well as how to incorporate the teaching materials into the intervention programme. More specifically, the researcher stressed on modelling the thinking process of narrative writing through demonstration with some examples of narrative writing topics suitable for primary four level students. By asking the WWW WHAT2 HOW2 and the WHY question, the teachers were shown how to achieve a rhetorical goal and hold the audiences' interest while planning and writing the narrative compositions. This justification of writers' planning, organising, and writing/revising was emphasised as the most important part of the intervention

programme. Teaching materials and lesson plans were provided by the researcher, and some teachers' feedback was used to improve the intervention programme.

The actual pedagogical intervention programme consisted of three lessons. Each lesson lasted 45 minutes. The lessons were conducted by English teachers for their respective classes. In the first lesson, the overall structure of the thinking process of narrative writing was introduced to the participants. The importance of setting a rhetorical goal, audience, and justifying a piece of written text with the 'why' questions was emphasised. Next, a writing topic and three pictures were introduced. The writing topics given were all topics that can be found in the units of the Strategies for English Language Learning and Reading (STELLAR) (2010) curriculum, such as 'my pet', 'a day in the park', and 'at the supermarket'. With the given topic and pictures, teachers first modelled how to set a goal and audience, then demonstrated the thinking process of planning out a story following the five stages of narrative writing: orientation, events, complication, resolution, and ending using the WWW WHAT2 HOW2 and WHY mnemonic chart. At the end of the first lesson, participants were instructed to perform self-assessment to assess the planning with the graphic organiser provided. Participants were told to assess their writing to see if their plans would help them to achieve the rhetorical goal and interest the audience. They were then asked to modify the planning if they were not satisfied with the self-assessment.

In the second and third lessons, teachers first reviewed at the beginning of the lesson the process of setting a rhetorical goal, target audience, as well as the thinking process. Teachers modelled the thinking process of writing (orientation and event) in the second lesson and the rest of the writing procedures (complication, resolution, and ending) in the third lesson based on the planning that they had done in the first lesson. The focus of the teacher' modelling always centred on using the 'why' questions to justify their choice of storyline. After modelling, the participants were then instructed to write their narrative composition. Self-assessments were performed at the end of all three lessons, and the participants were allowed to modify the written products based on their self-assessments. Finally, the participants were then able to complete the narrative composition during the third lesson of the intervention programme based on their revised plan.

Posttest

The posttest was conducted as part of the school examination at the end of the semester (i.e., Term 4 in 2015 and Term 4 in 2016). During the English writing examination, a topic and three

pictures were provided. All students were instructed to write a narrative composition using the topic provided and to include at least one of the three pictures in their writing. The duration of the examination was 45 minutes and the students were instructed to write at least 120 words. The posttest was performed by both control and experimental groups.

Participants' pretest, two pieces of writing during the intervention programme, and posttest written products were collected. 490 pieces of written products were collected. The collected written products were scanned and typed in word processor for the further analysis using computer software.

Class observations

There were class observations (totalling 21 lessons) over a 12-month period. All videos were subsequently transcribed. Field notes of the observations were used to describe the class and contextualise the lessons based on the observation. To analyse the lessons for the mediation process for the socio-cognitive approach to writing, the study uses two of Hyland's principles of writing instruction and Walqui's instructional scaffolding framework.

Data analysis

To determine if the quality of writing of the participants improved after the intervention programme, their pretest, two pieces of writing during the intervention programme, and posttest written products were holistically and statistically scored and analysed for changes in the four areas of macro-organisation, complexity, productivity, and accuracy. The written products collected were analysed by two raters, both of whom have obtained at least a Master degree in Applied Linguistics. More detailed explanation of the four areas will be elaborated as follows.

The first measurement of quality of writing in this study was macro-organisation, which was part of ten sub-categories of writing quality adapted from Wagner, Puranik, Foorman, Foster, Wilson, Tschinkel, and Kantor (2011) and Harris and Graham (1996). Wagner, Puranik, Foorman, Foster, Wilson, Tschinkel, and Kantor (2011) examined primary one and primary four students' persuasive writing in terms of macro-organisation, syntactic complexity, productivity, spelling, and punctuation errors. To assess macro-organization, Wagner et al. (2011) suggested holistic measurements in topic, logical ordering of ideas, and number of key elements.

As the current study is based on narrative writing, the thinking process was adapted from Harris and Graham (1996) and a 'story scale' element was adapted to measure macro-organisation of the written products. The story scale of the current study was composed of seven elements: the main

character, locale, time, starter event, problem, resolution, and ending. The presence of each of the seven elements in a piece of narrative composition would be awarded with one point, and if there was an additional elaboration, one or two points would be added to a maximum of nine points. In total, each piece of writing received a score between zero and 19 points on story scale.

All written products were graded separately. The two raters were not allowed to share their evaluation. The extent of agreement between the two raters involved in this study were calculated using Cohen's Kappa Coefficient, with values of .869 for the pretest, .930 for the posttest, .889 for the immediate posttest, and .814 for posttest, $p < .0005$. Based on Altman's (1991) guidelines for interpreting Kappa values, these values indicate a very high degree of agreement between the raters.

In previous research studies involving teaching writing through the socio-cognitive approach, writing quality was primarily examined holistically without using computer software for statistical analysis (Lane et al., 2010). In order to improve the robustness of the present study, only macro-organisation was scored holistically and other elements such as complexity, productivity, and accuracy were analysed using computer software.

The second measurement of quality of writing was productivity, which was analysed through fluency and lexical diversity. The total number of words was calculated for each piece of writing as an indication of fluency. In a study involving developing writing fluency and lexical complexity in university students, Fellner and Apple (2006) defined writing fluency as "the number of words produced in a specific time frame, irrespective of spelling and content, provided that the writer's meaning is readily understandable" (p. 19). It was defined so that writing fluency could be distinguished from accuracy and proficiency, which were related and crucial in evaluating ESL written products, but not the same as one another. With respect to lexical diversity, Number of Different Words (Expected Random 50) was measured using Lexical Complexity Analyser (LCA, Lu, 2012). This method of measurement differed from the Number of Different Words (NDW) used in Wagner et al. (2011) as NDW has been previously criticised due to its dependability on the standardisation of sample size (Lu, 2012). It was criticised mainly because NDW tends to increase when the text length is longer (Malvern, Richards, Chipere, & Durán, 2004, p. 19), and hence required additional standardisation procedures before data can be used for analysis. In this sense, NDWER50 is the improved version of NDW by standardising transcript lengths automatically and systematically. The LCA selects 50 words randomly from a text and repeatedly makes ten random samples with 50 words

respectively from each text. The mean score of ten samples would generate the NDWER-50 score of the original text.

The third measurement of quality of writing was complexity, whereby data was measured in three aspects: Mean Length of T-units (MLT), Dependent Clause per T-units (DC/T), and Mean Length of Clause (MLC) using the L2 Syntactic Complexity Analyzer (Yang, Lu, & Weigle, 2015). The L2 Syntactic Complexity Analyser was designed to automate syntactic complexity analysis of written English language samples using fourteen different measures proposed in the second language development literature (Lu, 2010). It was important to use an analytical tool that would take into account of multiple measures of complexity as it was proposed by Norris and Ortega (2009) that the conceptual triad of complexity, accuracy, and fluency ought to be measured with a more organic approach, whereby each trait is comprised of subsystems that interact dynamically all the time. MLT, DC/T, and MLC indicated complexity by (1) length, (2) subordination, and (3) clausal elaboration respectively. Using three different traits allowed us to measure syntactic complexity in a more stringent manner. We adopted the definition of 'T-unit' and 'clause' as they were used in L2SAC (Lu, 2010), in which a T-unit was defined as "one main clause plus any subordinate clause or non-clausal structure that is attached to or embedded in it" (Hunt, 1970, p. 4). A clause is "a syntactic unit which contains a finite verb" (Fischer, 1984, p. 15). Hunt claims that the length of a T-unit is parallel to the cognitive development in a child and thus the T-unit analysis provides an intuitively satisfying and stable index of language development. T-unit analysis has been used by Larsen-Freeman & Strom (1977) and Perkins (1980) as an objective measure to evaluate the quality of ESL student writing.

The fourth and last measurement of quality of writing was accuracy. The numbers of errors in spelling, capitalisation, and punctuation involving periods were coded using Systematic Analysis of Language Transcripts (SALT, Miller & Iglesias, 2015) software. These three types of errors were adopted from the writing coding scheme for overall writing quality (Adopted from Wagner, Puranik, Foorman, Foster, Wilson, Tschinkel, & Kantor, 2011, pp. 209–211). Convention rules for transcriptions for written text were adopted from SALT. Finally, the number of errors from each category was divided by 100 words to remove the sample size effect. The sub-categories of writing quality are illustrated in Table 2.

Table 2. *Summary of writing performance measures*

Area	Measure	Code
Macro-organisation	Story scale	-
Complexity	Mean Length of T-units	MLT
	Dependent Clause per T-unit	DC/T
	Mean Length of Clause	MLC
Productivity	Number of words	NOW
	Number of Different Words (Expected Random 50)	NDWER-50
Accuracy	Punctuation errors per 100 words	PNER-100W
	Capitalisation errors per 100 words	CPER-100W
	Spelling errors per 100 words	SER-100W

After the written products have been scored, the two-way mixed ANOVA was conducted to determine if there is any significant difference between (1) pretest and posttest, (2) six groups including three control and three experimental groups, and (3) interactions of times and groups.

For class observation data, there were two stages in the data analysis. For stage 1, all the lessons from the data set of 21 lessons were analysed initially by the first author for the presence of instructional scaffolding functions, and then with the second author counterchecking the analysis. The function was counted as present in the lesson as long as there was one occurrence/use. There were lessons where most of the teachers had not used the specific scaffolding function (e.g., re-presenting text). After each lesson was analysed for the presence/absence of all the instructional scaffolding functions, each instructional scaffolding function was calculated across the 21 lessons as a percentage to get an overview of the occurrence/usage of each instructional scaffolding function for all the lessons.

For stage 2, as part of descriptive data, two teachers' lessons (i.e., the same two teachers mentioned earlier) were analysed in detail for the use of the instructional scaffolding functions and examples from two teachers were used to illustrate the functions in actual classroom practice, as well as to compare and contrast the use by the two teachers in mediating writing. After discussing and looking through the 21 lessons, these two teachers were selected because both teachers could effectively engage the students and promote collaborative learning through effective questioning techniques or the use of diverse activities.

FINDINGS

RQ1: How do Primary Four English language teachers teach their classes in composition?

The findings presented (a) an overview of the use of the instructional scaffolding functions, and (b) descriptive datafrom two lessons as illustrations of the use by teachers in actual practice.

(a) An overview of the use of the instructional scaffolding functions

Regarding the occurrences of the instructional scaffolding functions for 21 lessons, in 95% of the lessons, outcomes and expectations of the lessons were stated explicitly when teachers told the students the learning objectives pertaining to writing at the start of the lesson or at the start of each specific activity, so that students knew what to expect for the lesson as a whole or at different stages of the lesson. That most teachers did so was not surprising because the teachers were trained to think about the rhetorical situation (i.e., purpose, audience, and context of writing) and their macro goal in the planning stage, i.e., they had to explain to students what was being studied, why it was being studied and what would be expected of them. In 76% of the lessons, examples of expected writing was provided as scaffolding. All the teachers used teaching material such as activity sheets, Power Point slides, videos, sample narratives, or analogies based on students' experiences to contextualise the learning of narrative. Teachers were engaged in schema building in 76% of the lessons but sharing of personal experiences or activating prior knowledge occurred in only 57% of the lessons. In 61% of the lessons, teachers encouraged some form of metacognitive thinking about writing narratives.

(b) Descriptive data from two lessons as illustrations of the use by teachers in actual practice

We present the findings in descriptive data to show how teachers mediate the learning of writing in actual practice. The findings are presented in terms of exemplars for each instructional scaffolding functions in two lessons. Teacher A had seven years of teaching experience. Teacher B has taught for five years.

In terms of lesson structuring, Teacher A went through modelling in the deconstruction stage of the genre approach by getting students to do story mapping for the stages of Character, Setting, Event, Problem, Solution, and Ending as a class, before constructing a story map for a parallel story through group planning. Teacher B was engaged in getting students to create a story about a positive or happy or surprising experience using Rory Cubes, and applying a "Do, say, think and feel" sentence that was taught in the previous writing lesson before completing individual quick writing for the planning stage of writing. The teacher also taught the concept of feelings being linked to something tangible or intangible.

Explicit Outcomes and Expectations

In mediating writing through instructional scaffolding, teachers need to clarify learning intentions and success criteria for students in teaching writing. The two teachers in this study stated explicitly the lesson outcomes at the beginning or throughout the lesson to raise students' awareness of what was being studied, why it was being studied, and what would be expected of them. While Teacher A reiterated the same outcome and expectation four times throughout the lesson as reinforcement, Teacher B stated different outcomes and expectations for each activity as Teacher B had various activities with different outcomes. Still, both teachers' expectations were in terms of what students had to do to demonstrate their learning.

Modelling

Mediating through scaffolding can be effected through the modelling stage of the genre teaching-learning cycle where the teacher provides a model text type and analyzes the text in terms of text structure and its linguistics features. This was seen in Teacher A indicating to students that sample texts would be shown to them later in the lesson to model how to write by showing the students the text structure of a parallel story and how to construct sentences to write the narrative according to the text structure.

For the instructional scaffolding function of modelling, besides students being given examples of the completed writing task, the teacher models appropriate language use for the expression of specific academic functions. Teacher B modelled the thinking process involved in constructing sentences to fit the requirement for the narrative to be about a pleasant surprise. Teacher B asked many questions to model how students needed to ask themselves questions while recalling what they had learnt the previous lesson—to enable students to be cognitively engaged in planning how to write. Both teachers made visible either text structure or self-talk for writing a story to the students.

Bridging: Activating Students' Prior Knowledge

The two teachers provided instructional scaffolding by using bridging approaches to help learners learn the concept of planning in writing mainly by activating students' prior knowledge. The teacher linked new contexts and understandings to what students already knew about writing through recapitulating what was taught in the previous lessons.

Contextualising

To make academic language more accessible and engaging for students, both teachers used analogies. Teacher A guided the students to understand the concept of main idea by using analogies and acting out to prompt students during group conferencing while Teacher B gave examples from real life scenarios to explain the concepts of tangible and intangible experiences.

Schema Building

Activating students' schema and weaving new information into pre-existing structures of meaning will enable students to accept new connections and organize knowledge and understanding. Both teachers did so by constant reference to what students had learnt about writing from their previous lessons through signaling words such as 'a quick recap', 'remember', 'you did it before right?'. This was to help students think about their pre-existing understanding of how to write so as to enable new applications such as coming up with their own story maps for Teacher A and using the "Do, Say, Think and Feel" sentences for Teacher B. Schema activation was done to build knowledge about the narrative genre to enable application in writing.

Re-Presenting Text

In terms of asking students to transform the linguistic constructions of one genre into another genre, only Teacher A seemed to be doing that in asking students to write a parallel story.

Developing Metacognition

Teacher A's development of students' metacognitive knowledge occurred during the students' group discussion to plan a group narrative in terms of Raphael, Englert, and Kirschner's (1989) types of metacognitive knowledge, (1) declarative knowledge when the students were reminded to focus on task goals and steps for writing in the teacher asking: 'What are the problems? Was there a condition'; (2) procedural knowledge by prompting the students on how strategies were to be implemented or deciding which strategy to use when composing: 'Your group, what are the ideas in your group? The characters? Who are the characters, what is the item that was dropped? Then what happened in the end?' and (3) conditional knowledge—the conditions to use a particular strategy or knowing when and why to use strategies during the writing process when the teacher told the students to 'write . . . brainstorm . . . the idea first . . . scribe your ideas' as the initial step in planning to write.

Teacher B developed the students' metacognitive knowledge throughout the lesson rather than during group work: (1) Declarative knowledge when the students were asked to recall the strategy they were taught to use in writing: 'So do you remember what did . . . we do in out last

writing? What was the topic? What strategy did we use?'; (2) procedural knowledge by prompting the students on the strategy used when they were composing: 'do you manage to write a complete sentence?' and (3) conditional knowledge—the conditions to use a particular strategy when the teacher reminded the students that for quick writing 'You can just write the gist of your story. So when you translate it to your composition, you may . . . you must include introduction you just also have your conclusion.'

RQ2: Are there any differences in the compositions produced under the traditional methods and the "socio-cognitive approach to writing" programmes? If so, what are they?

The findings are organised according to the four areas of macro-organisation, complexity, productivity, and accuracy, which were used to measure quality of writing to determine if there were any significant differences in their writing performance.

Macro-organisation

The two-way mixed ANOVAs were conducted to investigate (1) whether the scores of macro-organisation (story scale) were significantly different in the pretest and posttest; (2) whether there was any statistically significant interaction between time and groups regarding macro-organisation; and (3) whether there were any differences between the six groups of Control Group 1 (lower-proficiency), Control Group 2 (mid-proficiency), Control Group 3 (higher-proficiency), Experimental Group 1 (lower proficiency), Experimental Group 2 (mid-proficiency), and Experimental Group 3 (higher-proficiency).

First, the two-way mixed ANOVA showed that there was a statistically significant difference between pretest (M = 10.52, SD = 1.33) and posttest (M = 11.31, SD = 1.00) regardless of the groups. In other words, participants across groups showed significant improvement in macro-organisation (story scale) over time (see Table 3).

Table 3**.** *Descriptive statistics of the scores in the pretest and posttest by the groups*

Writing quality	**Pretest Mean (SD)**	**Posttest Mean (SD)**
Story scale (TOTAL)	10.52 (1.33)	11.31 (1.00)
Control group 1	9.50 (1.58)	10.80 (1.14)
Control group 2	9.50 (1.51)	11.38 (0.91)
Control group 3	11.12 (1.01)	11.52 (0.71)
Experimental group 1	10.05 (1.50)	11.15 (1.35)
Experimental group 2	10.74 (0.99)	11.53 (0.77)
Experimental group 3	11.06 (0.77)	11.19 (1.05)

Also, the two-way mixed ANOVA results revealed that there was a statistically significant interaction between the groups and time on macro-organisation, $F (5, 92) = 2.407$, $p < .05$, partial $\eta^2 = .116$, which indicates a small effect size (within-subjects contrasts). It can be inferred that the starting proficiency level of the groups had stronger impact on the performance on some aspects of macro-organisation than on others. It also indicated a significant effect on the time variable, $F = (1, 92) = 35.229$, $p < .05$, partial $\eta^2 = .277$, large effect size. On this basis, the timing of the tests administered, the pretest and the posttest in this case, has a statistically significant but small impact on the macro-organisation of the writing quality regardless of the type of group. Tests of between-subjects effects showed that the difference in types of groups had a significant main effect on the scores on macro-organisation, $F (5, 92) = 4.371$, $p < .05$, partial $\eta^2 = .192$, medium effect size. This main effect was the impact of groups on the scores from all tests combined. Though the increase in mean scores were observed for all groups, the difference in improvement between groups were found to be insignificant.

Productivity

Number of words

The number of words for each piece of written product was calculated to examine the effects of the socio-cognitive intervention programme on productivity. The two-way mixed ANOVA found that participants performed significantly better in posttest ($M = 283.23$, $SD = 94.50$) compared to pretest ($M = 211.42$, $SD = 83.57$), $F (1, 92) = 60.74$, $p = .000$, partial $\eta^2 = .398$, large effect size, regardless of groups. In other words, participants generally wrote longer texts in their posttests than in their pretests.

Also, there was a statistically significant difference in the number of words written between groups, $F (5, 92) = 12.51$, $p = .000$, partial $\eta^2 = .405$, large effect size. Furthermore, one-way ANOVA revealed that in both the pretest and the posttest, Control Group 3 presented the longest text lengths. In the pretest, all the other groups wrote significantly fewer words than Control group 3 ($M = 142.5$, $SE = 25.12$, $p = .000$). In the posttest, however, Experimental groups 1 and 2 wrote significantly fewer words than Control group 3, while Experimental group 3 did not. Therefore, it can be inferred that though a general trend of increase in number of words can be observed in Experimental groups 1 and 2, participants in Experimental Group 3 demonstrated the most significant amount of increase in number of words in comparison, $F (1, 92) = 60.74$, $p = .000$, partial $\eta^2 = .398$, large effect size. Thus,

the results suggested that the socio-cognitive intervention programme has the most substantial impact on the lowest-achieving students on number of words in narrative writing.

Table 4. *Descriptive statistics of the number of words written by different groups in both tests*

Writing quality	Pretest Mean (SD)	Posttest Mean (SD)
Number of words (TOTAL)	211.43 (83.57)	283.23 (94.50)
Control group 1	151.90 (38.70)	277.30 (98.39)
Control group 2	160.88 (28.14)	263.25 (97.44)
Control group 3	294.40 (89.73)	346.88 (95.17)
Experimental group 1	174.45 (43.71)	219.75 (39.46)
Experimental group 2	191.58 (73.21)	253.58 (89.01)
Experimental group 3	214.06 (68.11)	312.06 (84.74)

Number of different words (Expected Random 50)

We examined Number of Different Words (Expected Random 50) to find out the impact of the socio-cognitive writing programme on language productivity in the aspect of number of different words produced in a piece of narrative writing.

Table 5. *Descriptive statistics of the number of different words written by different groups in both tests*

Writing quality	Pretest Mean (SD)	Posttest Mean (SD)
NDWER50 (TOTAL)	102.89 (35.08)	125.67 (37.24)
Control group 1	74.40 (6.70)	97.50 (14.65)
Control group 2	91.88 (21.98)	106.25 (12.30)
Control group 3	86.72 (28.16)	105.68 (22.11)
Experimental group 1	88.50 (15.60)	121.30 (33.76)
Experimental group 2	129.32 (34.58)	154.05 (39.80)
Experimental group 3	138.06 (34.26)	156.00 (34.89)

The two-way mixed ANOVA found that participants performed significantly better in posttest (M = 125.67, SD = 37.24) compared to pretest (M = 102.89, SD = 35.08), F (1, 92) = 42.69, p = .000, partial η^2 = .317, large effect size, regardless of groups. In other words, participants generally used more diverse vocabulary in their posttests than in their pretests.

In addition, the differences between groups had a significant main effect on the number of different words, F (5, 92) = 17.77, p = .000, partial η2 = .491, large effect size. One-way ANOVA showed that there was statistically significant difference in number of different words between the groups in the pretest, F (5, 92) = 14.60, p = .000, partial η2 = .442, large effect size, as well as in the posttest, F (5, 92) = 11.36, p = .000, partial η2 = .382, large effect size.

In making comparisons between groups in the pretest and the posttest respectively, some unexpected findings were noted. Firstly, in the pretest, Control group 1 (M = 74.40, SE = 8.51, p

< .05) displayed significantly fewer different words than all three Experimental groups. Secondly, Control groups 2 (M = 91.88, SE = 9.51, p <.05) and 3 (M = 86.72, SE = 5.38, p < .05) displayed significantly fewer different words than Experimental groups 2 (M = 129.32, SE = 6.17, p < .05) and 3 (M = 138.06, SE = 6.72, p < .05). Lastly, Experimental groups 2 and 3 displayed significantly more different words than all other groups other than between themselves in the pretest. Given that the participants were placed in their respective groups based on their proficiency level, it was interesting to note that the Experimental groups have demonstrated more varied words in their pretest narrative writings than those in the Control groups.

In the posttest, it can be seen from the means as shown in Table 5 that most participants generally increased in number of different words over time. The most noteworthy finding was that Experimental groups 2 and 3 performed significantly better in number of different words compared to all three Control groups after treatment. Therefore, it could be inferred that the socio-cognitive writing programme may have more significant impact on students with higher proficiency levels within the under-achieving group.

Complexity

Mean Length of T-unit, Dependent Clauses per T-unit, and Mean Length of Clause were analysed to investigate the impact of socio-cognitive writing programme on syntactic complexity.

Complexity by length (Mean Length of T-units)

Table 6 shows the mean and standard deviation of the mean lengths of T-units in the pretest and posttest. It can be seen that amongst the Control groups, only Control group 1 (low progress) improved in the mean length of T-units in their posttest, while control groups 2 and 3 decreased in their MLT. As for the Experimental groups, a general increase in number of T-units was observed across all experimental groups, with Experimental group 1 showing the most improvement. The two-way mixed ANOVA showed that there was no significant difference in performance between pretest and posttest, and no significant difference groups either. Based on the means and the results of the two-way mixed ANOVA, it can be inferred that the socio-cognitive writing programme had no noticeable impact on the mean length of T-units in the duration of the study.

Table 6. *Descriptive statistics of the MLT by different groups in both tests*

Writing quality	**Pretest Mean (SD)**	**Posttest Mean (SD)**

Complexity-MLT (TOTAL)	11.15 (2.97)	11.90 (4.89)
Control group 1	11.77 (2.28)	14.93 (9.09)
Control group 2	12.29 (2.69)	11.41 (2.56)
Control group 3	10.89 (2.60)	9.85 (2.17)
Experimental group 1	12.32 (4.69)	14.10 (6.74)
Experimental group 2	10.46 (1.96)	11.69 (3.81)
Experimental group 3	9.99 (1.55)	11.00 (1.65)

Complexity by subordination (Dependent clauses per T-unit)

Based on the means and the results of the two-way mixed ANOVA, it can be inferred that the socio-cognitive writing programme had no noticeable impact on the mean length of T-units in the duration of the present study.

A one-way ANOVA was conducted with proficiency level as the independent variable, and the DC/T as the dependent variable for the pretest and the posttest respectively. The results indicate no significant effect of proficiency level on the DC/T, $F (5, 92) = 2.256$, $p > .05$, partial $\eta 2 = .109$ for the pretest, but a significant and medium effect in the posttest, $F (5, 92) = 2.570$, $p = .03$, partial $\eta 2 = .123$. Post hoc test showed no significant differences between all groups.

Complexity by clausal elaboration (Mean Length of Clause)

The two-way mixed ANOVA showed no statistically significant difference between pretest and posttest in MLC, $F (1, 92) = .119$, $p = .730$, partial $\eta 2 = .001$. One-way ANOVA also yielded no significance in MLC between pretest and posttest.

Though differences are not significant, it can be seen from Table 7 that Experimental groups 1 and 3 obtained higher means in MCL scores in posttest, whereas only Control group 1 obtained higher means in MCL scores in posttest.

Table 7. *Descriptive statistics of the MLC by different groups in both tests*

Writing quality	**Pretest Mean (SD)**	**Posttest Mean (SD)**
Complexity-MLC (TOTAL)	6.91 (0.98)	6.96 (1.54)
Control group 1	7.07 (0.85)	7.15 (1.66)
Control group 2	6.60 (0.78)	6.49 (0.80)
Control group 3	7.18 (1.05)	6.74 (0.90)
Experimental group 1	6.77 (1.15)	7.47 (2.68)
Experimental group 2	6.99 (1.02)	6.78 (1.18)
Experimental group 3	6.62 (0.72)	7.01 (0.85)

Accuracy

Number of capitalisation, spelling, and punctuation errors were calculated and divided by 100 words to remove samples size effect.

Table 8. *Descriptive statistics of the capitalisation, spelling, and punctuation errors by different groups in both tests*

Writing quality	Pretest Mean (SD)	Posttest Mean (SD)
Capitalisation error / 100 words	**1.07 (1.53)**	**0.71 (1.27)**
Control group 1	0.98 (1.15)	1.48 (0.69)
Control group 2	1.29 (0.69)	1.50 (2.35)
Control group 3	2.10 (2.35)	0.94 (1.20)
Experimental group 1	1.05 (1.20)	0.72 (0.48)
Experimental group 2	0.29 (0.48)	0.15 (0.28)
Experimental group 3	0.33 (0.28)	0.15 (1.53)
Spelling error / 100 words	**2.98 (3.33)**	**1.95 (2.58)**
Control group 1	8.00 (7.81)	6.21 (5.56)
Control group 2	4.14 (2.00)	2.34 (1.03)
Control group 3	2.54 (1.89)	1.93 (1.83)
Experimental group 1	2.67 (1.43)	1.58 (1.31)
Experimental group 2	1.64 (1.15)	0.68 (0.57)
Experimental group 3	1.93 (1.42)	1.08 (0.87)
Punctuation error / 100 words	**0.90 (0.91)**	**0.76 (0.97)**
Control group 1	1.75 (0.84)	1.60 (1.12)
Control group 2	2.08 (1.34)	1.79 (1.57)
Control group 3	0.69 (0.87)	0.98 (0.98)
Experimental group 1	0.85 (0.59)	0.60 (0.70)
Experimental group 2	0.54 (0.65)	0.32 (0.33)
Experimental group 3	0.59 (0.60)	0.11 (0.17)

For capitalisation errors, the two-way mixed ANOVA showed no significant difference between pretest (M = 1.07, SD = 1.53) and posttest (M = 0.71, SD = 1.27). However, there is significant difference between groups in the pretest (F (1, 92) = 4.849, p = .001, partial η2 = .209, medium effect size) and posttest (F (1, 92) = 3.228, p = .010, partial η2 = .149). A notable comparison can be made in the mean scores of capitalisation errors between the Control groups and the Experimental groups. As it can be seen from the mean scores in Table 8, only Control group 3 (high-proficiency) produced fewer capitalisation errors in the posttest amongst the Control groups, whereas all Experimental groups produced fewer such errors in the posttest.

For spelling errors, the two-way mixed ANOVA showed that there was a significant difference between pretest (M = 2.98, SD = 3.33) and posttest (M = 1.95, SD = 2.58) regardless of the groups. In other words, participants across groups showed significant improvement in spelling over time. It also indicated a significant effect on the time variable, F = (1, 92) = 44.671, p = .000, partial η2 = .327, large effect size. On this basis, it can be inferred that participants' number of spelling errors reduced over time regardless of groups. Tests of between-subjects effects showed that the difference in types of groups had a significant main effect on the mean scores on spelling errors, F (1, 92) = 9.516, p

< .05, partial η2 = .341, large effect size. This main effect was the impact of groups on the scores from all tests combined. Furthermore, one-way ANOVA showed that the difference in proficiency level between groups has a significant impact on spelling scores, F (1, 92) = 7.849, p = .000, partial η2 = .299, large effect size. However, no significant difference in the means of number of spelling errors can be observed when compared between the groups.

For punctuation errors, the two-way mixed ANOVA showed no significant difference between pretest (M = 0.90, SD = 0.91) and posttest (M = 0.76, SD = 0.97). Tests of between-subjects effects showed that the difference in types of groups had a significant main effect on the mean scores on spelling errors, F (1, 92) = 11.822, p < .05, partial η2 = .391, large effect size. A notable interesting finding is that the as can be seen from the mean scores on punctuation errors in Table 8, Control group 3 (high-proficiency) was the only group that produced more punctuation errors in the posttest as compared to all other groups. One-way ANOVA showed that there was significant difference between groups in the pretest (F (1,92) = 7.671, p = .000, partial η2 = .294, large effect size) and the posttest (F (1,92) = 8.102, p = .000, partial η2 = .306, large effect size).

CONTRIBUTIONS OF STUDY

Contributions in terms of practice

School leaders can further support pupils by:

a. Extending the duration of the research programme, to allow pupils more practice with forming the required thinking processes under the guidance of their teachers.

b. Providing more preparation time at the beginning of the programme, so that pupils can practise the task of self-regulation using the WWW WHAT2 HOW2+WHY chart to conceptualise key stages of the writing process.

Contributions in terms of policy and research

The socio-cognitive approach to writing can be applied to across different levels of studies and different abilities of the students. The study can inform policies that target low progress students for continual assistance. Further research can be conducted to find out how instructional scaffolding functions may be used for different kinds of genres.

CONCLUSION

The present study has investigated how teachers helped primary school students mediate learning on how to write narratives through these instructional scaffolding functions: explicit outcomes and expectations, modelling, bridging, contextualizing, schema building, re-presenting text and developing metacognition. While this study echoed the findings of Simeon (2015) in terms of modelling, bridging and contextualizing, the study has extended Simeon's study by investigating all of Walqui's (2006) instructional scaffolding functions by looking at 21 lessons for an overview of usage and specific examples drawn from two teachers' classroom talks. The specific examples from these teachers provides qualitative descriptive data in the domain of pedagogical approaches in writing for primary school students.

Though the teachers were shown to utilize most of the instructional scaffolding functions, for future research, more studies need to be conducted to find out which instructional scaffolding functions will be predominantly used and for what kinds of writing genres in addition to how these functions will vary with different groups of teachers and students. Still, the adapted instructional scaffolding functions provide a means for teachers to mediate the learning of writing and the present study suggests that both teachers and trainers in teacher education courses might pay more attention to developing teachers' understandings of the role of mediating learning to write through instructional scaffolding functions.

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