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Empowering learners in the second/foreign language classroom: Can self-regulated learning strategies-based writing instruction make a difference?

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1. Introduction

In the sphere of educational psychology, self-regulated learning (SRL) is best realized as a dynamic, constructive process, whereby learners set up learning goals and then monitor, regulate, and control their cognition, motivation, and behavior (Zimmerman & Schunk, 2011). During the past three decades, extensive research on SRL has proven its salient role in improving students' academic achievement and fostering proactive learners in a range of educational and psychological contexts (see Zimmerman, 2013, for more information). There is an increasing recognition that strategic, self-regulated learning lies at the heart of second/foreign language (L2) teaching and learning for promoting self-regulated learners who are independent, capable, and goal-oriented with lifelong learning strategies (Csizér & Tankó, 2017; Oxford, 2017; Zhang, Thomas, & Qin, 2019). Effective deployment of SRL strategies is considered as a prominent factor in promoting L2 learners' capacity to accomplish learning goals (Dörnyei & Ryan, 2015; Han & Hiver, 2018; Tseng, Dörnyei, & Schmitt, 2006). Many researchers, thus, have argued that instruction in self-regulated, strategic learning can result in better academic outcomes (Gu, 2010; Harris & Graham, 2009; Oxford, 2017; Zhang & Zhang, 2019). As Gu

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(2010, p. 1) explained, "the central thesis behind language learning strategy research is that learners, supported by teachers and curricula, can play a much more active role in managing and controlling the learning process, thereby maximizing the outcomes of learning". Unfortunately, there is insufficient evidence attempting to uncover how instruction in SRL strategies can help L2 students develop into self-regulated language learners in skill-specific areas such as writing in classroom environments.

Writing is a complex, recursive process, which subsumes the multiple interactive stages of strategic functions in cognitive maneuvering (e.g., idea generation, outlining, drafting, revising, and editing), metacognitive control (e.g., evaluation and monitoring), and motivational regulation (e.g., interest enhancement and goal-oriented control) (Csizér & Tankó, 2017; Harris & Graham, 2009; Teng & Zhang, 2018). Some L2 researchers have acknowledged that writing achievement is contingent upon the deployment of SRL strategies through which different dimensions of SRL processes actively function in mobilizing, directing, and sustaining learning efforts (Han & Hiver, 2018; Teng & Zhang, 2016a, 2018). The prerequisite of the active deployment of SRL strategies lies in people's judgments of competence in regulating learning processes, which is known as academic self-efficacy beliefs (Bruning, Dempsey, Kauffman, McKim, & Zumbrunn, 2013; Schunk & Ertmer, 2000). With positive self-efficacy beliefs, students can adapt to the demands of learning tasks, successfully perform knowledge, and actively use different strategies to sustain their learning and increase their emotional readiness to learn (Bernacki, Nokes-Malach, & Aleven, 2015; Bruning et al., 2013; Pajares, 2007; Teng, Sun, & Xu, 2018).

Following the recent call for diversifying vibrant research on language learning strategies (Griffiths, 2019; Zhang et al., 2019), the primary objective of this study was to apply self-regulation theory to L2 writing with a focus on SRL strategies-based instruction. We believe that a cross-disciplinary understanding of SRL strategies plays a crucial role in advancing theoretical functions of self-regulation theory and extending its application to L2 learning in general and L2 writing in particular. We also argue that the findings of this empirical study may contribute to the innovation of writing courses embedded with SRL strategies for promoting effective learning of L2 writing.

2. Theoretical framework and relevant literature review

2.1. Sociocognitive theory and SRL strategies

Sociocognitive theory emphasizes the "triadic reciprocity in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other" (Bandura, 1986, p. 18). This comprehensive theory is widely used to explain how people acquire competencies, values, and styles of behavior and how people motivate and regulate their learning. Sociocognitive views of SRL regard learners as agents, whose learning behavior is under the reciprocal influence of their past behaviors, personal variables (e.g., interest and self-efficacy), and environmental variables (e.g., task difference, instructional supports and conditions, social modelling, and feedback) (Winne & Hadwin, 2010).

Meanwhile, learners' performance and achievement in various learning contexts are under the influence of self-evaluation. According to Bandura (1991, p. 257), people's beliefs in their competence, known as self-efficacy, function as "an important set of proximal determinants of human self-regulation". Within the SRL framework, self-efficacy beliefs are regarded as a human capacity to regulate thoughts, motivation, affect, and action through self-reactive influence (Schunk & Ertmer, 2000). As an essential component of self-regulation theory, self-efficacy beliefs affect self-monitoring and cognitive processing of different aspects of academic performance (Bandura, 2006). It has been reported that high levels of perceived self-efficacy were often related to positive outcomes such as setting challenging goals, showing more commitment to learning, actively using a wider range of strategies to learn, and orchestrating greater persistence in completing academic tasks (see Bernacki et al., 2015, for a review).

Effective SRL processes require learners' active deployment of a range of strategies to help them intentionally activate, sustain, and adjust cognition, affect, and behavior to achieve their learning goals (Zimmerman & Schunk, 2011). Previous empirical studies have found that the active use of SRL strategies (e.g., cognition, metacognition, and motivational regulation) contributes to cognitive development, knowledge acquisition, and creativity stimulation in a range of learning contexts (Hammann, 2005; Teng & Zhang, 2016b; Zimmerman, 2013). In the self-regulating process, learners, for example, need to use cognitive strategies to construct, transform, and apply knowledge when completing a task. A plethora of research has confirmed the essential role of cognitive strategies (e.g., text processing, revising, and organization) in promoting academic achievement (e.g., Zhang, Aryadoust, & Zhang, 2016, 2019). Meanwhile, metacognitive strategies, such as the executive control of cognition, typically materialize themselves through regulatory activities like planning, monitoring, and evaluating. Successful metacognitive strategies-based instruction was found to be helpful to promote students' SRL capacity and academic outcomes (Sato & Loewen, 2018).

Another important dimension of SRL strategies is motivational regulation, which refers to procedures or thoughts that students apply purposefully to sustain or increase their willingness to engage in a task (Wolters & Mueller, 2010). As Dörnyei (2005) has argued, the purpose of motivational regulation strategies is "to generate and enhance student motivation, as well as maintain ongoing motivated behavior…" (p. 117). Motivational regulation is closely tied to students actively monitoring and regulating their willingness to expend efforts or persistence on academic tasks (Teng & Zhang, 2018; Wolters & Hussain, 2015). Previous studies reported that the perceived use of motivational regulation strategies played a mediating role in affecting students' choice, effort, cognitive engagement, and academic performance (Schwinger & Otterpohl, 2017; Teng & Zhang, 2018).

Sociocognitive views of SRL also place a particular emphasis on the role of socializing agents such as parents, teachers, and peers in learners' development of self-regulation (Boekaerts, Pintrich, & Zeidner, 2000). Hadwin and Oshige (2011) have argued that the active deployment of social behavior strategies for interactive support from such socializing agents as teachers and peers is beneficial to learners' performance. Meanwhile, SRL emphasizes the importance of feedback loops in which learners monitor, evaluate and adjust strategies, goals, and motivational factors in a given task (Zimmerman, 2013). One interesting finding is that learners' handling

of others' feedback mediated the use and adjustment of other strategies, and, in turn, affected learning outcomes (Sato & Loewen, 2018; Zimmerman, 2011).

2.2. SRL strategies-based instruction in L1 writing contexts

SRL strategies-based instruction has been well established in L1 writing contexts, where students are provided with effective strategies for completing writing tasks so that they would be more resourceful, self-reflective, and goal-oriented (Graham & Harris, 2014). Having acknowledged the essential role of SRL strategies, a number of scholars have engaged in applying self-regulation theory to the implementation of strategies-based writing instruction with fruitful outcomes (see Harris, Graham, MacArthur, Reid, & Mason, 2011; Harris, Graham, Mason, & Friedlander, 2008; MacArthur, Philippakos, & Ianetta, 2015). Harris et al. (2011, p. 189) posited that "understanding the role of self-regulation in the development of writing abilities, the difficulties students encounter with self-regulation of the writing process, and effective instructional practices for developing competence in self-regulated writing is clearly essential to help students develop as writers."

Among these instructional studies, the most prevailing is the Self-Regulated Strategy Development (SRSD) model, which was grounded in sociocognitive theory and SRL theory (Harris & Graham, 1996). The SRSD model is composed of six recursive stages: developing and activating background knowledge, discussing, modelling, memorizing, supporting, and independent performance. The major goals of the SRSD model are to "help students master the higher level of cognitive processes; develop autonomous, reflective, self-regulated use of effective writing strategies; increase knowledge about the characteristics of good writing; and form positive attitudes about writing and themselves as writers" (Graham & Harris, 1996, p. 352). Many empirical studies have reported the positive effects of the SRSD model on improving academic achievement and cultivating self-regulated learners from primary to high schools across genres in L1 writing (see Harris et al., 2011; Harris & Graham, 2009; MacArthur et al., 2015, for more information).

Noticeably, research on SRL strategies-based instruction is fruitful in L1 writing contexts, and thus should be worthy of being evaluated in terms of its contribution to L2 writing, as some researchers have argued (Zhang et al., 2016). Yet, there are a number of critical issues that should be considered to ensure that the research leads to theoretically valid, replicable outcomes. For example, whether the SRSD model could be directly applied to L2 writing instruction; whether similar positive effects of the self-regulation instruction could be gained in a new learning context; or how the SRL process sheds light on the innovation of L2 teaching and learning. All of these queries deserve a full empirical investigation.

2.3. SRL strategies-based instruction in L2 writing contexts

Previous achievement in L1 contexts shows promise for L2 writing instruction. The positive effect of strategies-based instruction has been highlighted in a rich body of the L2 literature focusing on different aspects of writing strategies (De Silva & Graham, 2015; Nguyen & Gu, 2013; Roca de Larios, Manchón, Murphy, & Marín, 2008). Meanwhile, there is growing interest in applying self-regulation theory to L2 strategies-based instruction for consolidating the conceptual framework of the instruction, maximizing learning outcomes, and promoting learners' active engagement (Ching, 2002; Lam, 2014; Oxford, 2017; Zhang et al., 2016). Ching (2002), for example, administered a seven-week strategy and self-regulation instruction to engineering students who were enrolled in a Technical English course in a Malaysian university. The instruction included pre-writing planning, revising, peer-evaluation, explicit reflection on the writing process, and strategy use. Ching's study suggested that the integration of self-regulation into L2 strategy instruction was useful to foster sufficient self-awareness of students' own learning processes, which in turn contributed to their active use of strategies and positive academic outcomes. Lam (2014) investigated how explicit strategy instruction shaped the students' metacognitive knowledge and facilitated their development of SRL in EFL writing. A 15-week process-oriented writing course was implemented with a focus on specific composing strategies (i.e., prewriting, planning, redrafting, evaluating, revising, and editing) in a cyclic writing process. Results showed that participants improved their metacognitive knowledge of using planning, reorganizing, and problem-solving strategies and became more motivated and confident in the writing process.

Although an array of empirical studies has shown the positive effect of strategies-based instruction with the integration of SRL, a number of issues still remain. Prominent concerns include the methodological shortcomings (e.g., small sample sizes, non-random group assignment, or exclusion of control groups); the complexity of variables that affect L2 strategy use; a lack of valid and reliable instruments; and the absence of a comprehensive theory, as pointed out by a number of scholars (Cohen & Griffiths, 2015; Manchón, Roca de Larios, & Murphy, 2007; Plonsky, 2011).

Manchón et al. (2007) argued for exploring strategy training in socially-situated approaches to understanding learners' actions and called for longitudinal intervention (at least 10–15 weeks) which would help resolve the uncertainty of the effect of strategy instruction on language development. In addition, they also suggested that researchers "take a stance regarding which theoretical framework is going to inform their enquiry and exploit it in full" (p. 248). Plonsky (2011) also argued for selecting learning strategies based on the pre-treatment measures of strategy use to design individualized strategies-based writing instruction. Informed by these suggestions, we conducted a longitudinal investigation into SRL strategies-based instruction with a solid theoretical framework and reliable measures designed for specific L2 writing contexts.

3. Methods

Conceptualized in sociocognitive theory, the present study explored how SRL strategies-based writing instruction affected

students' writing performance, reported use of SRL strategies, and perceived academic self-efficacy. This is a quasi-experimental research design with an intervention group and a control group. The intervention lasted for five months to implement SRL strategies-based writing instruction, modified from the SRSD model (Harris & Graham, 1996). Two research questions guided this empirical study:

RQ1: Did SRL strategies-based writing instruction have any impact on the intervention group's writing test scores, SRL strategies, and academic self-efficacy?

RQ2: If yes, how did the intervention group and the control group differ after the intervention ended?

Data were collected via pre-, post- and delayed post-writing tests to investigate the changes of students' writing proficiency. Self-reported questionnaires were used at the beginning and the end of the intervention to examine respondents' reported use of SRL strategies and academic self-efficacy.

3.1. Participants

A convenience sampling strategy was used to recruit participants of English majors from a medium-ranking university in China. A total of nine intact classes in the second-year of undergraduate study received the invitation and four of them (N = 80) agreed to join. All the participants were recruited on a voluntary basis and they were informed of their rights to withdraw from the research at any time during or after the data collection. They were assured that there was no evaluation of their academic performance and participation or non-participation in the study did not influence their grades. At the time of the study, all these students were enrolled in a required English writing course and they had never received any strategies-based writing instruction before.

We first assigned random numbers to the four intact classes and allocated them to two conditions (an intervention group and a control group). Then we used statistical methods to examine whether there were some significant differences between the two groups prior to the intervention. The comparison of the baseline conditions of the two groups will be reported in the Result section. Descriptive analyses showed that the two groups shared similar demographic backgrounds in terms of the average age, gender proportion, and years of English learning (see Table 1).

3.2. Instruments

3.2.1. Writing strategies for self-regulated learning questionnaire

This study used the Writing Strategies for Self-regulated Learning Questionnaire (WSSRLQ), which operationalized SRL strategies as learners' proactive engagement in the writing process under the influence of cognition, metacognition, behaviors, and motivational regulation (Teng & Zhang, 2016a). It was a self-report questionnaire using a seven-point Likert-scale, ranging from 1 (not at all true of me) to 7 (very true of me). The instrument was designed as a context-based, task-specific measurement, to be used for evaluating SRL strategies in L2 writing contexts.

The WSSRLQ measured four dimensions of SRL strategies, including cognitive strategies (text processing and knowledge rehearsal), metacognitive strategies (goal-oriented monitoring and idea planning), social behavior strategies (feedback handling and peer learning), and motivational regulation strategies (motivational self-talk, interest enhancement, and emotional control) (see Appendix A). The reliability (e.g., internal reliability) and validity (e.g., content validity, construct validity, predictive validity, convergent validity, and discriminant validity) of the measurement were evaluated in EFL writing contexts in tertiary education with satisfactory results (Teng & Zhang, 2016a, 2018). The validated research setting was highly similar to our research context where an English writing course was required to be taught to undergraduate students to improve their academic writing skills. In our sample, the internal consistency reliability coefficients (Cronbach's alpha) ranged from α = .785 (emotional control) to α = .913 (motivational self-talk), suggesting good reliability of these factors. Table 2 presents the results of the means, *SDs,* and internal reliability of the questionnaire.

3.2.2. Second language writer self-efficacy scale

The Second Language Writer Self-efficacy Scale (L2WSS) was used to evaluate students' academic self-efficacy in L2 writing contexts (Teng et al., 2018). It was designed with a seven-point Likert scale ranging from 1 (not at all true of me) to 7 (very true of me). Informed by sociocognitive theory and SRL theory, the scale was designed as a context-based and course-targeted instrument to evaluate a three-dimensional model of writing self-efficacy, including linguistic self-efficacy (e.g., I can revise basic grammar errors in my writing), self-regulatory efficacy (e.g., I can evaluate whether I achieve my goal in writing) and performance self-efficacy (e.g., I can understand the most difficult material presented in the writing course). Teng et al. (2018) applied confirmatory factor analysis to examine the reliability and validity of the scale on data collected from Chinese EFL learners in tertiary education. The study confirmed a three-factor structure of the L2WSS with satisfactory psychometric properties (i.e., internal and composite reliability,

Table 1
Demographic Information of the Intervention and Control Groups.

Groups	*N*	N_{Female} *(%)*	*Mean Age*	*Years of English Learning*
Intervention	39	30 (77 %)	18.875 (*SD* = 1.24)	8.97 (*SD* = 1.12)
Control	41	29 (71 %)	18.742 (*SD* = 1.32)	9.19 (*SD* = 1.14)

Table 2
Descriptive Analysis and Internal Reliability of SRL Strategies.

Dimensions of SRL Strategies		*M*	*SD*	α
Cognition	Tex processing (6 items)	4.71	1.50	.85
	Knowledge rehearsal (3 items)	4.18	1.12	.80
Metacognition	Idea planning (3 items)	4.73	0.91	.79
	Goal-oriented monitoring (6 items)	3.55	1.26	.86
Social Behaviour	Peer leaning (3 items)	3.33	1.11	.80
	Feedback handling (4 items)	5.47	1.17	.79
Motivational Regulation	Interest enhancement (4 items)	4.51	1.02	.84
	Motivational self-talk (8 items)	5.16	1.43	.91
	Emotional control (3 items)	5.64	1.33	.79

convergent validity, discriminant validity, and construct validity). In the present study, the values of internal reliability for the three factors were much higher than the benchmark value (.70) (linguistic self-efficacy α = .845; self-regulatory efficacy α = .832; performance self-efficacy α = .876). Appendix B shows the factors and items of the L2WSS.

3.2.3. Pre-, post- and delayed post-writing tests

Argumentative essays with given topics were used to investigate students' writing performance. Argumentative writing is known as the most popular and paramount standardized assessment for L2 learners. Hirvela (2017, p. 69) argued that "the capacity to write effective argumentative essays is an important marker of L2 writing ability." At the tertiary level in China, university students are frequently asked to write arguments in linguistically complex, issue-driven tests in most academic disciplines (Huang & Zhang, 2019; Zhang, 2013).

In this study, both the intervention and the control groups were invited to complete three in-class writing tasks at the beginning, the end, and one-month after the intervention. During each test, students were required to complete a given-topic essay of at least 200 words based on the prompt (e.g., title of the topic and information outline) within 60 min. Each administration of the writing test had the same level of difficulty, but each was on a different topic. In this study three writing topics were chosen from the past-year papers of Test for English Majors (TEM), Band 4. The TEM is a nationally acknowledged assessment for evaluating English-majors' language proficiency in reading, writing, listening, and translation. The TEM writing topics are designed as general, culturally inoffensive, and familiar to participants' daily life with the same difficulty to guarantee the fairness to every student (Zheng & Cheng, 2008). To control the effects caused by the writing task difference, we took a counterbalanced approach to distribute three writing topics. This means that in the pre-test around one third of students in each group were given Task A, another one third Task B, and the rest Task C. Then, the tasks were reversed in the post-and delayed post-tests. All the participants had the same chance of completing different writing tasks in pre-, post-, and delayed post-tests. Appendix C presents writing tasks used in this study.

The analytic scoring rubric developed by Jacobs, Zinkgraf, Wormuth, Hartfiel, and Hughey (1981) was used to assess the overall quality of these essays. The rubric uses a weighted scoring scheme on a percentile scale, measuring five aspects of writing performance: content (30 %, 13–30), organization (20 %, 7–20), language (25 %, 5–25), vocabulary (20 %, 7–20), and mechanics (5 %, 2–5). Each of the subcategories has four rating levels with clear descriptors of the writing proficiency for that level and a corresponding numerical scale.

Two independent raters who are experienced EFL teachers with master's degrees in applied linguistics went through a standardization procedure in a training session. Neither of them was familiar with the research design to avoid bias when they evaluated these essays. The intra-rater coefficient for Rater One was $r = .96$ and for Rater Two was $r = .95$ and the inter-rater reliability between the two raters was $r = .91$, indicating satisfactory reliability.

3.3. SRL strategies-based writing instruction

The SRL strategies-based writing instruction was developed based on the SRSD model with modification in consideration of L2 writing contexts.

As shown in Fig. 1, the instructional model included six recursive stages: Knowledge activation, teacher-led discussion, modeling, memorizing, supporting, and independent performance. Specific instructional procedures were implemented, beginning with teachers provoking students' prior knowledge about essays of different genres (e.g., persuasive essays, argumentation, and narration) through critically reviewing selected writing examples. For instance, EFL students were required to discuss in a group (3–4 students) the characteristics of a persuasive opinion essay. Then teachers introduced POW strategies (**P**ick my idea; **O**rganize my notes; **W**rite and say more) and TREE strategies (**T**opic sentence: the premise of the paper; **R**easons: supporting details for the premise; **E**nding: wrapping it up right; **E**xamining) (see Harris et al., 2011, for detailed explanation). After that, students identified the POW and TREE strategies used in two essay samples. During this period, teachers challenged students or provoked their in-depth thinking by asking some critical questions such as: *Does the essay clearly explain the premise? How are transition words used to reinforce the argument? How can you make your argument more persuasive? What are the evidence-based arguments you can present in your essay? Are supporting details provided to bolster your arguments?* Meanwhile, teachers

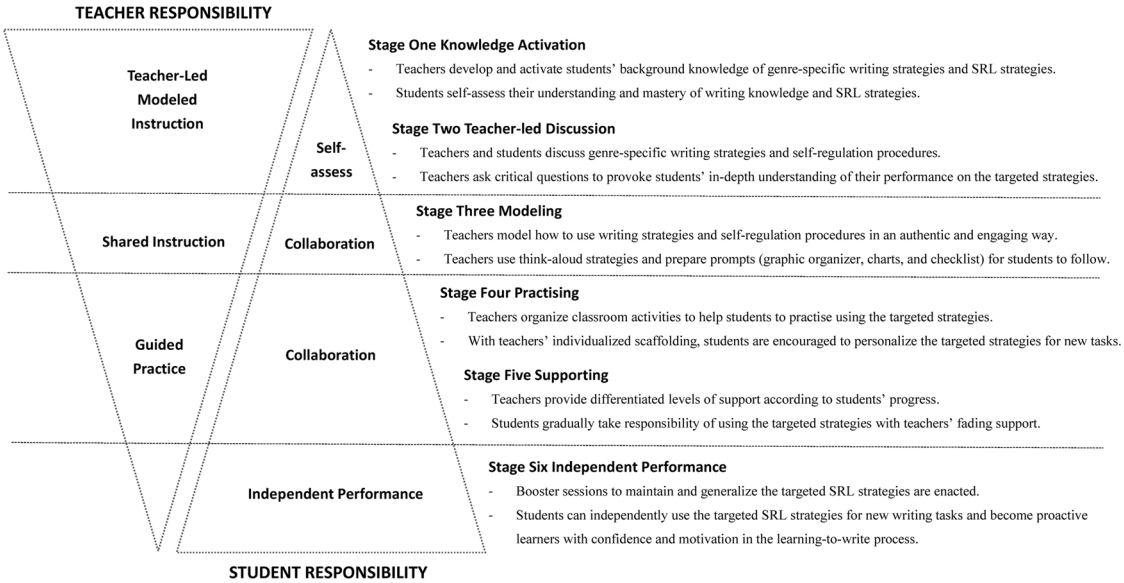

Fig. 1. Self-regulated Learning (SRL) Strategies-Based Instructional Model.
(Adapted from Harris et al., 2008).

discussed with students the use of different SRL strategies (e.g., idea planning, goal setting, self-monitoring) in the learning-to-write process. Then they modeled the writing process through orchestrating the writing strategies (POW and TREE strategies) in tandem with the utility of idea planning and goal-setting strategies. Along with their teachers, students' performance was examined by analyzing their previously written essays and comparing them with the new pieces of writing. They were also encouraged to jot down goals for self-monitoring and evaluate their performance by using teacher-developed checklists. Different forms of classroom activities (e.g., group discussion, cue cards, self-monitoring notes) were organized to help students memorize the targeted strategies for active use in new tasks. During the instruction, teachers roved over the classroom to provide individualized scaffolding to each student based on their progress. They gradually faded their support to the students until these students independently used the writing and SRL strategies. For strategy generalization, teachers and students worked collaboratively to identify the opportunities to use the targeted strategies and modify them in new settings or tasks.

It should be noted that the above stages were not linear but recursive and based on the progress of students. The instructional process was individualized and criteria-based rather than time-based, so that students could move through each instructional stage at their own pace and proceed to later stages of instruction after they met initial criteria for doing so. The instructional procedures were designed in authentic, enthusiastic, and engaging ways, in which students were encouraged and empowered to take control of their own learning based on teacher and peer feedback. Students were encouraged to set up learning goals and provided with sufficient opportunities to monitor and evaluate their mastery of learning strategies as they completed different writing tasks.

Throughout the instructional process, teachers acted as mediators and collaborators who shouldered the most responsibility in the first three stages. In the activating process, for instance, it was suggested that teachers could generate more open-ended questions to arouse students' critical thinking on what strategies were useful for them to solve writing problems and whether they had applied those strategies in the learning-to-write process. The teachers could use think-aloud to demonstrate how, why, and when to apply these strategies in the learning-to-write process. However, such responsibility gradually became marginal and finally was removed when students were able to apply these strategies independently and actively generalize them to other learning environments.

3.3.1. Selection of the targeted SRL strategies during the intervention

The selection of the targeted strategies was based on the following criteria. First, the targeted strategies were genre-based and task-driven, which were directly relevant to the syllabus of the writing course in the term when data were collected. Second, the selection of SRL strategies was informed by the process writing approach with a focus on the pre-during-after composing processes. Thus, four types of SRL strategies were selected, including text processing, idea planning, goal-oriented monitoring, and peer learning. These strategies reflect three dimensions of SRL: cognition, metacognition, and social behavior. We anticipated that these targeted strategies would help students relieve their cognitive load with the facilitation of social support from peers in classroom environments and promote their active use of linguistic knowledge to produce a written text.

It should be noted that motivational regulation strategies were not included during the intervention for several reasons. First, during instructor training, writing teachers complained about the time-consuming nature of teaching motivational regulation strategies during their regular writing courses. They also pointed out that motivational regulation strategies were not directly related to

writing tasks required to be completed in the course. Another important reason is that motivational regulation strategies such as emotional control and interest enhancement were not reported being directly related to linguistic performance in some empirical studies (Teng & Zhang, 2018). Informed by our review of the literature, we came to an understanding that successful instruction in other dimensions of SRL strategies (cognitive and metacognitive strategies) would contribute to students' positive deployment of motivational regulation strategies.

3.3.2. Teacher training

This study implemented a four-week teacher training workshop prior to the instruction because scholars have reported that teacher training often enables instructors to initiate, support, and sustain students' use of SRL strategies and active engagement in the self-regulating process (e.g., Zimmerman, 2008). The two instructors of the intervention group were invited to attend weekly workshops (two hours per week), which introduced different writing strategies in relation to cognition (e.g., text processing), metacognition (e.g., planning, evaluating, and goal setting), and social behavior (e.g., peer learning). The research team modeled how to integrate SRL strategies into regular writing courses. After each workshop, the teachers engaged in collective and critical reflection on the possibilities of integrating different SRL strategies into regular writing courses, as well as practical constraints they might encounter. Then the research team discussed these challenges and worked together with the teachers to find some possible solutions and adjust the instructional process when necessary.

3.4. Procedures

At the beginning of the term, all participants from the two groups were invited to complete the WSSRL questionnaire and the L2WSS to collect data on their reported use of SRL strategies and perceived academic self-efficacy. The same measurements were conducted at the end of the intervention as the result of the post-test. In order to examine the effect of instruction on writing performance, given-topic writing tests were administered to both groups at the beginning and the end of, and one month after, the intervention.

Prior to the instruction, two EFL teachers were invited to attend a one-month teacher training workshop and, after that, they were allocated to the two classes of the intervention group to implement a five-month writing instruction. The intervention group received the 20-week writing instruction (once a week for 1.5 h) while the control group received the usual academic writing courses, required by the university curriculum and syllabus (20-week, once a week for 1.5 h). During the writing courses, both groups were instructed in process writing and genre-based writing (e.g., narration, exposition, persuasive essay, and argumentation). In order to guarantee the comparability of the two groups, we ensured that both groups used the same textbook and the same in-and-after class writing tasks. Instructors in the intervention group strictly followed the six stages of SRSD model to instruct the targeted SRL strategies. The time spent on teaching SRL writing strategies as part of the writing course was about 20 h in total. It is important to note that the teaching of SRL strategies was integrated in the process of teaching writing itself as research in L1 contexts has already shown that integrating SRL strategies into the regular course systematically often produces positive results (Harris et al., 2011).

3.5. Data analysis

Data collected via questionnaires and writing tests were cleaned, and important aspects such as the normal distribution of data, missing values, and outliers were checked. The data were then subjected to statistical analysis to check whether there were any statistically significant differences between the two groups at the time of the pre-test in terms of personal factors (gender, age, and years of English learning), writing proficiency, reported use of SRL strategies, and perceived writing self-efficacy. Then, the effects of SRL strategies-based instruction on SRL writing strategies, academic self-efficacy, and writing test scores within and between the two groups were examined.

A series of paired samples *t*-tests was applied to examine the writing score gains within groups. An analysis of covariance (ANCOVA) with repeated measures was conducted to compare group differences, with the pre-test writing scores as covariate, to remove any pre-existing difference in writing proficiency between the two groups. Partial eta square (η^2) was reported for evaluating the magnitude of effect sizes (small = .01; medium = .06; large = .14) when comparing the group differences (Cohen, 1988).

Given that the Likert-scales of SRL strategies and writing self-efficacy are non-parametric, Wilcoxon signed-rank tests and Mann-Whitney *U* tests were applied to compare the differences within and between the two groups. The effect sizes (*ES*) were reported to determine the degree of association between the groups by using the following formula:

$$ES = \frac{|z|}{\sqrt{n}}$$

Cohen' (1988) assignment of effect sizes' relative strength (small = .01; medium = .03; large = .50) was applied as an index for us to report on the magnitude of the effect sizes.

Table 3
Descriptive Statistics and Independent Samples t-tests of Writing Test Scores Between the Intervention Group and the Control Group in the Pre-test.

Writing Test Score	Group	*N*	*M*	*SD*	*t*	*p*	95 % *CI*	
							LL	*UL*
Content	EXP	39	22.21	3.26	.130	.41	−1.60	1.85
	CON	41	22.10	3.49				
Organization	EXP	39	15.09	2.15	−.142	.73	−1.18	1.37
	CON	41	15.65	1.72				
Vocabulary	EXP	39	15.36	1.98	.120	.69	−.97	1.03
	CON	41	15.03	1.97				
Language	EXP	39	18.24	2.98	−.529	.72	−1.68	1.21
	CON	41	18.61	2.75				
Mechanics	EXP	39	4.47	.66	−.077	.59	−.33	.37
	CON	41	4.48	.72				
Total Scores	EXP	39	75.06	9.49	−.057	.91	−4.87	4.93
	CON	41	75.84	8.73				

Note. The writing rubric used a weighted scoring scheme on a percentile scale, measuring five aspects of writing performance: content (30 %, 13–30), organization (20 %, 7–20), language (25 %, 5–25), vocabulary (20 %, 7–20) and mechanics (5 %, 2–5); *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit; EXP = intervention group, CON = control group.

4. Results

4.1. Comparison of baseline conditions of the two groups in the pre-test

4.1.1. Demographic information

Descriptive analyses showed that the average ages of students from the intervention group and the control group were similar (M_{EXP} = 18.88, SD = 1.24; and M_{CON} = 18.74, SD = 1.32). Students from the two groups reported, on average, nine years of English learning (M_{EXP} = 8.97, SD = 1.18; M_{CON} = 9.19, SD = 1.14). A series of independent samples *t*-tests showed no statistically significant differences between the two conditions in terms of age and years of English learning. Gender comparisons between the two groups were checked by a Chi-square test of independence and no significant difference was found, $x^2(1) = .46$, $p = .49$.

4.1.2. Writing test scores

As shown in Table 3, the two groups had similar writing test scores (M_{EXP} = 75.06, SD = 9.49; M_{CON} = 75.84, SD = 8.73). Independent samples *t*-tests found no significant differences between the two conditions in terms of the total score and the five aspects of writing performance: Content, organization, vocabulary, language, and mechanics. This means that students from the two conditions had a similar level of writing proficiency before the intervention.

4.1.3. SRL strategies

The average means of the nine SRL strategies fluctuated between 3 (*slightly not true of me*) to 5 (*slightly true of me*). In general, before the intervention, students from the two conditions reported a slightly positive use of motivational regulation strategies, feedback handling, text processing, and idea planning. However, these students held a slightly negative attitude towards using goal-oriented monitoring (metacognitive strategies) and peer learning (social behavior strategies). Nonetheless, Mann-Whitney *U* tests did not detect any significant differences in the reported use of the nine SRL strategies between the two groups in the pre-test.

4.1.4. Writing self-efficacy

The average means of the three factors of writing self-efficacy ranged between 4 (*neutral*) to 5 (*slightly true of me*). The students reported being slightly confident in using linguistic knowledge (linguistic self-efficacy) and completing tasks in class (performance

Table 4
Paired Samples *t*-tests of Writing Scores in the Pre-, Post- and Delayed Post-tests for the Intervention Group and the Control Group.

Group	Pre-test (T1)			Post-test (T2)			T1vsT2			Delayed Post-test (T3)			T1 vs T3		
	N	M	SD	N	M	SD	t	p	Cohen's d	N	M	SD	t	p	Cohen's d
EXP	39	75.06	9.71	37	86.07	5.84	9.02	< .001	2.11	34	84.26	5.56	7.734	.006	1.85
CON	41	75.84	8.73	38	79.68	6.68	3.01	< .001	.49	32	78.29	6.45	2.082	.009	.28

Note: The writing rubric used a weighted scoring scheme on a percentile scale, measuring five aspects of writing performance: content (30 %, 13–30), organization (20 %, 7–20), language (25 %, 5–25), vocabulary (20 %, 7–20) and mechanics (5 %, 2–5); EXP = intervention group, CON = control group.

Table 5
Descriptive Analysis of the SRL Strategies in the Pre- and Post-tests in the Intervention Group and the Control Group.

SRL Strategies		Group	Pre-test			Post-test		
			N	M	SD	N	M	SD
Cognition	Text Processing	EXP	39	4.83	1.05	37	5.25	1.22
		CON	41	4.70	1.04	38	4.92	1.19
	Knowledge Rehearsal	EXP	39	4.24	1.32	37	4.41	1.32
		CON	41	4.18	1.33	38	4.27	1.58
Metacognition	Idea Planning	EXP	39	4.73	1.16	37	5.35	.87
		CON	41	4.67	1.34	38	4.88	.86
	Goal-oriented Monitoring	EXP	39	3.76	1.23	37	5.01	1.16
		CON	41	3.34	1.04	38	3.56	1.25
Social Behaviour	Peer Learning	EXP	39	3.44	1.28	37	5.08	1.24
		CON	41	3.21	1.38	38	3.46	1.65
	Feedback Handling	EXP	39	5.44	.84	37	5.61	1.01
		CON	41	5.49	1.03	38	5.57	.98
Motivational Regulation	Interest Enhancement	EXP	39	4.49	1.33	37	5.11	1.01
		CON	41	4.53	1.19	38	4.68	1.52
	Motivational Self-talk	EXP	39	5.23	1.23	37	5.49	1.04
		CON	41	5.10	.85	38	5.04	1.04
	Emotional Control	EXP	39	5.57	1.09	37	5.96	.92
		CON	41	5.67	.93	38	5.65	1.02

Note. This is a 7-point Likert scale; 1 = not at all true of me; 2 = not true of me; 3 = slightly not true of me; 4 = neutral; 5 = slightly true of me; 6 = true of me; 7 = very true of me; EXP = intervention group, CON = control group.

self-efficacy) while being neutral in regulating their learning-to-write process (self-regulatory efficacy). No significant difference was found between the two groups in the three subcategories of self-efficacy in the pre-test.

Taken together, the statistical analyses revealed that the two groups were comparable, prior to the intervention, in a variety of factors (i.e., age, year of English learning, gender, SRL strategies, self-efficacy, and writing performance).

4.2. Changes in writing test scores within and between groups

A series of paired samples *t*-tests revealed that students from the intervention group had significant gains in the writing test scores in the post-test ($M_{\text{Gain}} = 11.01$, $SD = 4.19$); $t\ (36) = 9.02$, $p < .001$ and the delayed post-test ($M_{\text{Gain}} = 9.21$, $SD = 3.84$); $t\ (33) = 7.73$, $p < .001$. The effects of gains were strong in the post-test ($d = 2.11$) and the delayed post-test ($d = 1.85$).

Likewise, students from the control group demonstrated improved writing scores in the post-test ($M_{\text{Gain}} = 3.84$, $SD = 2.91$); $t\ (37) = 3.01$, $p = .006$ with a medium effect size ($d = .49$) and in the delayed post-test ($M_{\text{Gain}} = 2.46$, $SD = 1.34$); $t\ (31) = 2.08$, $p = .009$ with a small effect size ($d = .28$). Table 4 shows the descriptive statistics and results of paired samples *t*-tests in the pre-, post- and delayed post-tests. As a whole, students from both groups demonstrated an obvious improvement in writing performance after the instruction and such gains remained one month after the intervention although the magnitude waned.

ANCOVA revealed significant differences in writing gains between the two groups, $F\ (1, 73) = 68.79$, $p < .001$, partial $\eta^2 = .56$ in the post-test, and $F\ (1, 64) = 55.34$, $p < .001$, partial $\eta^2 = .44$ in the delayed post-test. The covariate was also significant, $F\ (1, 73) = 42.73$, $p < .001$, partial $\eta^2 = .44$ in the post-test and $F\ (1, 64) = 38.65$, $p < .001$, partial $\eta^2 = .36$ in the delayed post-test. It is clear that the intervention group made more improvement than the control group after the intervention in the post-test with a large effect size, and maintained this improvement at the time of the delayed post-test. However, it should be noted that the gaps between the two groups became smaller with a declining effect size. This shows that the SRL strategies-based instruction had a large effect on improving writing test performance and this positive effect was sustained until one month later. In addition, students' prior-writing proficiency was a critical determinant of their performance at the time of the post- and delayed post-tests.

4.3. Changes in SRL strategies within and between groups

Table 5 presents descriptive results of the nine SRL strategies in the pre-and-post tests. We present how the intervention affected the different dimensions of SRL strategies respectively within and between the two conditions in the following sections.

4.3.1. Cognitive strategies

Descriptive statistics showed that the mean scores of text processing strategies (targeted strategy) of the intervention group increased from $Pre\text{-}M_{EXP} = 4.83$ ($SD = 1.05$) to $Post\text{-}M_{EXP} = 5.25$ ($SD = 1.22$). A Wilcoxon signed-rank test revealed that the experiment group reported a significant increase in using text processing strategies ($z = 2.05$, n = 37, $p = .04$) with a moderate effect size ($ES = 0.34$). However, no significant change was found for the control group between the pre-test ($M_{CON} = 4.70$, $SD = 1.04$) and the post-test ($M_{CON} = 4.92$, $SD = 1.19$).

The average mean scores of knowledge rehearsal as a non-targeted type of cognitive strategies increased slightly in the post-test in both groups, but no significant change was found within each group between the pre-test and the post-test.

In the post-test, results of Mann-Whitney *U* tests revealed that there were no significant differences between the two groups in the reported use of text processing ($U = 332$, $n_1 = 37$, $n_2 = 38$, $p = .067$) and knowledge rehearsal ($U = 422.50$, $n_1 = 37$, $n_2 = 38$, $p = .82$).

4.3.2. Metacognitive strategies

Descriptive analysis showed that students from the intervention group reported positive changes in goal-oriented monitoring from $Pre\text{-}M_{EXP} = 3.76$ ($SD = 1.24$) to $Post\text{-}M_{EXP} = 5.01$ ($SD = 1.16$) and idea planning from $Pre\text{-}M_{EXP} = 4.73$ ($SD = 1.05$) to $Post\text{-}M_{EXP} = 5.35$ ($SD = 1.22$). A Wilcoxon signed-rank test showed that the intervention group had significant increases in goal-orientated monitoring ($z = 3.45$, n = 37, $p = .001$, $ES = .57$) and idea planning ($z = 2.73$, n = 37, $p = .040$, $ES = .45$) between the pre-test and the post-test. However, no significant change was found in the control group.

In the post-test, the medians of the goal-oriented monitoring in the control and intervention groups were around 4 and 5 respectively, and the distributions in the two groups differed significantly with a strong effect size ($U = 203.51$, $n_1 = 37$, $n_2 = 38$, $p < .001$, $ES = .52$). Likewise, medians of idea planning in the control group were 4.67 and 5.33 with significantly different distributions ($U = 269.54$, $n_1 = 37$, $n_2 = 38$, $p = .01$, $ES = .32$). Therefore, we can argue that the data support the effectiveness of self-regulatory intervention in promoting students' use of metacognitive strategies.

4.3.3. Social behavior strategies

Students in the intervention group reported an increase in peer learning strategies (targeted strategy) from $Pre\text{-}M_{EXP} = 3.44$ ($SD = 1.28$) to $Post\text{-}M_{EXP} = 5.08$ ($SD = 1.24$). Medians changed from 3 to 5 with a significant result of the Wilcoxon signed-rank test ($z = 3.52$, n = 37, $p < .001$, $ES = .58$) in the pre- and post-tests. However, the control group reported a minimal change in peer learning strategies from $Pre\text{-}M_{EXP} = 3.21$ ($SD = 1.38$) to $Post\text{-}M_{EXP} = 3.46$ ($SD = 1.66$). No significant within-group difference was found for the control group.

As expected, Mann-Whitney *U* tests revealed a significant difference in terms of using peer learning strategies between the two groups ($U = 241.5$, $n_1 = 37$, $n_2 = 38$, $p = .008$, $ES = .41$) in the post-test. The median of the experiment group (around 5) was much higher than that of the control group (around 3). This means that the intervention group students became more positive in using peer learning strategies than those in the control group. When compared, the medians of feedback handling (non-targeted strategy) for two groups were around 5.5 (between *a slightly true of me* to *true of me*) and thus no group difference was found in the post-test.

4.3.4. Motivational regulation strategies

Although motivational regulation strategies were not included in the focused strategies, the intervention group reported clear increases in using interest enhancement ($Pre\text{-}M_{EXP} = 4.49$, $SD = 1.33$; $Post\text{-}M_{EXP} = 5.11$, $SD = 1.01$), motivational self-talk ($Pre\text{-}M_{EXP} = 5.23$, $SD = 1.23$; $Post\text{-}M_{EXP} = 5.49$; $SD = 1.04$), and emotional control ($Pre\text{-}M_{EXP} = 5.57$, $SD = 1.09$; $Post\text{-}M_{EXP} = 5.96$, $SD = .92$) in the post-test. Wilcoxon signed-rank tests showed that the intervention group had significant increases in interest enhancement ($z = 2.43$, n = 37, $p = .044$, $ES = .41$) and emotional control ($z = 2.17$, n = 37, $p = .048$, $ES = .36$) between the pre-test and the post-test. However, no significant changes were reported in the use of motivational regulation strategies in the control group between the pre- and post-tests.

Mann-Whitney *U* test demonstrated that the group difference had a significant effect on interest enhancement ($U = 301$, $n_1 = 37$, $n_2 = 38$, $p = .043$, $ES = .24$). Medians for the intervention and control groups were around 5 and 4, suggesting that students from the intervention group tended to use more strategies to enhance their learning interest than those in the control group. However, no significant differences were found in using other two types of motivational regulation strategies at the time when the post-test was conducted.

Table 6
Descriptive Analysis of Self-efficacy in the Pre- and Post-tests for the Intervention Group and the Control Group.

Self-efficacy	Group	Pre-test			Post-test		
		N	M	SD	N	M	SD
Linguistic Self-efficacy	EXP	39	5.13	1.03	37	5.67	1.12
	CON	41	5.25	.94	38	5.36	.92
Self-regulatory Efficacy	EXP	39	4.27	1.02	37	4.48	1.09
	CON	41	4.34	1.08	38	4.39	1.14
Performance Self-efficacy	EXP	39	4.65	1.07	37	5.28	1.01
	CON	41	4.71	.86	38	4.86	1.16

Note. This is a 7-point Likert scale; 1 = not at all true of me; 2 = not true of me; 3 = slightly not true of me; 4 = neutral; 5 = slightly true of me; 6 = true of me; 7 = very true of me; EXP = intervention group, CON = control group.

4.4. Effects on academic self-efficacy

Table 6 shows descriptive analysis of the three factors of self-efficacy in the pre-test and the post-test. Wilcoxon signed-rank tests revealed that the intervention group had significant increases in linguistic self-efficacy ($z = 2.67$, n = 37, $p < .001$, $ES = .43$) and performance self-efficacy ($z = 2.32$, n = 37, $p < .03$, $ES = .38$) in the post-test, except for self-regulatory self-efficacy. No significant difference was found for the three subcategories of self-efficacy in the control group between the pre-test and the post-test.

The medians of linguistic self-efficacy for the experiment and control groups were around 5.5 and 5, and the medians of performance self-efficacy were 5.25 and 4.66. Mann-Whitney U tests revealed that students from the intervention group outperformed the control group in linguistic self-efficacy ($U = 272.3$, $n_1 = 37$, $n_2 = 38$, $p = .008$, $ES = .39$) and performance self-efficacy ($U = 311.5$, $n_1 = 37$, $n_2 = 38$, $p = .044$, $ES = .21$). This means that the intervention group developed a certain level of confidence in using linguistic knowledge to generate a text as well as completing tasks in writing classes upon completion of the intervention program.

Interestingly, the reported level of self-regulatory efficacy remained the lowest for the two groups ($M_{EXP} = 4.48$; $M_{CON} = 4.39$) in the post-test while no significant difference was reported between the groups.

5. Discussion

We examined the effects of a five-month SRL strategies-based writing instruction program and found some positive results in terms of L2 writing performance, SRL strategies, and academic self-efficacy. As a whole, students from the intervention group outperformed the control group in writing performance after the intervention was completed. They also became more active in deploying different SRL strategies, particularly the metacognitive strategies. For example, they tended to think about the core elements of a good composition and monitor mastery of knowledge directed by specific learning goals. They also showed a trend to use strategies to explore different ways to engage more enthusiastically with writing tasks. In addition, the intervention helped students become more self-efficacious in using linguistic knowledge to generate a written text. Meanwhile, those students developed positive self-efficacy in classroom performance, such as mastery of the writing knowledge and completion of the writing task.

5.1. Effects on writing performance

The intervention group significantly outperformed the control group with a large effect size in the post-test and the delayed post-test. This reveals the positive effects of the SRL strategies-based instruction on writing outcomes as reported in studies on L2 writing (Ching, 2002; Lam, 2014; Zhang et al., 2016). We could conclude that the integration of self-regulation into the writing instruction contributed to raising students' awareness of controlling and reflecting their learning processes, which helped them to achieve better academic outcomes than those who did not received SRL strategies-based instruction.

We also found that the intervention produced a persistent effect on improving students' writing performance one month after the instruction. This finding lends support to the transferability of the sustained effects of self-regulated strategy writing instruction from L1 to L2 contexts. Further, the magnitude of the difference between the two groups waned one month after the treatment. Such a result indicates the necessity to incorporate the SRL strategies-based instruction into regular courses on a long-term basis to sustain the positive influence, as researchers have suggested (Graham & Macaro, 2007; Plonsky, 2011).

It is also worth noting that the pre-existing writing proficiency collected from the pre-test was a significant factor influencing students' writing test performance. We therefore argue that it is necessary for practitioners to take students' linguistic competence into consideration while implementing strategies-based writing instruction.

5.2. Effects on SRL strategies

Regarding the effects on the cognitive dimension, no significant difference was found in students' reported use of text processing (targeted strategy) between the two groups in the post-test. One possible reason may be that teachers from both groups focused on the instruction of linguistic knowledge in the learning-to-write process. Our results also revealed that only the intervention group reported a significant increase in using text processing strategies in the post-test. This suggests that the instruction in text processing strategies produced a positive effect on students' use of, or attitude towards, the importance of the text producing processes. We, thus propose that if the length of the intervention could be sustained longer, a significant effect on the improvement of using text processing strategies might be ensured between the two groups in the post-test.

Metacognitive strategies included two types of focused strategies (goal-oriented monitoring and idea planning) during the intervention. The intervention group reported using more metacognitive strategies to regulate and monitor their learning processes or to generate more ideas before writing than the control group. For example, after the five-month instruction, students from the intervention group tended to monitor their mastery of writing knowledge taught in the intervention, set up goals for directing their learning activities, and then evaluate their progress based on task goals. These positive changes suggest that the metacognitive strategies instruction, in its form as recursive procedures, appeared to have raised students' awareness, enhanced their understanding, and encouraged their use of these strategies, as also empirically evidenced in other L2 research contexts (Sato & Loewen, 2018; Zhang & Qin, 2018).

Regarding the social behavior dimension, peer learning as a targeted strategy was designed to focus on peer interaction in classroom environments (e.g., collaborating with peers to complete a writing task) during the instruction. The intervention

helped students understand the effect of peer learning strategies in promoting their academic performance. According to Zimmerman and Schunk (2011), peer interaction contributes to constructing a cooperative learning environment which helps students relieve the cognitive load and psychological burden. Our results, thus, provide tentative support for the salient role of sociocultural factors in fostering SRL, which is regarded as a culturally rooted, socially mediated process "wherein students learn to internalize language, signs and activities existing first in the sociocultural practices of their communities" (Winne & Hadwin, 2010, p. 506).

Although motivational regulation strategies were not targeted during the instructional process, students from the intervention group became more strategic in increasing their learning interest or controlling their negative emotions when completing a writing task. The intervention group students tended to use more interest enhancement strategies than did their counterparts in the control group. This indicates that the explicit SRL strategies instruction related to cognition, metacognition, and social behavior may have helped students become proactive in their learning process and more intensely engaged in using strategies to control their intrinsic motivation (e.g., interest enhancement and emotional control). We posit that the positive deployment of motivational regulation strategies, in turn, fostered and mediated students' engagement in writing tasks and deployment of other SRL strategies (Teng & Zhang, 2018; Wolters & Hussain, 2015).

5.3. Effects on academic self-efficacy

Our study revealed that the intervention group became more confident in accomplishing various writing tasks in the classroom (performance self-efficacy) and utilizing linguistic knowledge in the process of text generation (linguistic self-efficacy) than the control group. From a sociocultural perspective, one plausible reason might be that teacher scaffolding, along with peer collaboration throughout instruction, may have increased students' self-confidence in their task performance. In previous research scholars have argued that scaffolding can ease students' cognitive load and make learning tasks more manageable (Lantolf & Poehner, 2008; Zhang et al., 2016). However, no significant difference was found in terms of self-regulatory efficacy between the two groups in the post-test of our study. The non-significant difference might be due to the fact that the items of self-regulatory efficacy in this study emphasized people's judgment of their capabilities to set up, monitor, and evaluate goal-directed activities; this form of regulation needs a high level of metacognitive control, which often requires a longer time to develop (Teng et al., 2018).

6. Conclusion

This longitudinal, quasi-experiment research was set up to examine the effects the SRL strategies-based writing instruction in EFL writing classrooms. Our results suggest that such an intervention was successful in developing students' higher levels of cognitive engagement, fostering their proactive use of writing strategies, increasing their self-efficacy in regulating their learning performance, and promoting positive academic outcomes. The multi-dimensional SRL strategies instruction reflects a sociocognitive view of human beings as agents who intentionally activate, sustain, and adjust cognition, affect, and behavior to achieve learning goals (Zimmerman, 2011). The cyclical, instructional stages are consistent with the development of SRL, which is "moving from observation, through emulation of others usually involving guided practice, to self-control, and finally to self-regulation" (Winne & Hadwin, 2010, p. 506).

At the level of the curriculum and course design, our findings suggest that integrating the SRL instructional model into regular writing instruction will be beneficial to student learning, so that writing teachers can select specific writing strategies based on the requirement of curricula, writing tasks, or results of diagnostics measuring students' use of SRL strategies. Our study also provides empirical evidence in favor of teaching clusters of SRL strategies with a consideration of individual differences. We recommend that diagnosis be done about students' use of SRL strategies and affective conditions (e.g., performance self-efficacy and self-regulatory efficacy) along with their language proficiency prior to implementing any SRL strategies-based instruction program. This will likely enhance the efficacy of the writing courses and arouse learners' motivation in the learning-to-write process. By referring to the diagnostic information as precursors to any writing intervention, EFL practitioners may be empowered to adjust their pedagogical goals to boost the effectiveness of strategies-based writing instruction. Meanwhile, EFL teachers are encouraged to continue their quest for implementing multi-dimensional strategies-based writing instruction, which not only focuses on cognitive and metacognitive evaluation but also integrates social behavioral and motivational regulation strategies. This implies that strategies-based writing instruction should be sensitive to students' needs and aim to equip students with a range of SRL strategies from different dimensions for their successful completion of different writing tasks, as suggested by many researchers (Lam, 2014).

There are also some limitations of the current study. One is that the instruction only targeted four specific SRL strategies in cognitive, metacognitive, and social behavioral dimensions, while motivational regulation strategies, a salient component of the SRL process, were not included. Therefore, one important goal for future research is to implement EFL writing instruction with a focus on other dimensions of SRL strategies relating to motivational regulation strategies for developing self-regulated writers (Schwinger & Otterpohl, 2017; Teng & Zhang, 2016b; Zhang et al., 2019).

In addition, the intervention study only recruited second-year English majors from one medium ranking university in China. Another area of research would be to examine variations in participants at different proficiency and grade levels during the intervention study. Thus, the question can be raised: *Would similar results be obtained if this treatment were replicated with students in an L2 context at different levels of proficiency or grades?* The advantage of looking across different year levels would be in capturing the dynamic development of SRL.

Having acknowledged the limitations, we nonetheless believe that the SRL strategies-based writing instruction was successful in helping the students become more awareness of the effectiveness of SRL strategies from a multi-dimensional perspective, better

understand the richness of the repertoire of SRL strategies, develop positive writing self-efficacy, and enhance their writing performance. Consistent with Hsiao and Oxford's (2002) contention, our findings suggest that strategies-based instruction can "pave the way toward greater proficiency, learner autonomy, and self-regulation" (p. 372). We can summarize that our study provides some empirical evidence for the feasibility of applying self-regulation theory to the L2 writing contexts for fostering self-regulated writers, who are not only independent, capable, reflective, and goal-oriented, but also well equipped with lifelong learning strategies (Oxford, 2017).

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Appendix A. The Writing Strategies for Self-regulated Learning Questionnaire

Not at all true of me	Not true of me	Slightly not true of me	Neutral	Slightly true of me	True of me				Very true of me		
1	2	3	4	5	6				7		
Text Processing											
1. When writing, I use some literary devices to make the composition more interesting.					1	2	3	4	5	6	7
2. When revising, I check grammar mistakes.					1	2	3	4	5	6	7
3. When revising, I check spelling and punctuation.					1	2	3	4	5	6	7
4. When revising, I check the structure for logical coherence.					1	2	3	4	5	6	7
5. When revising, I check the cohesiveness or connection among sentences.					1	2	3	4	5	6	7
6. When revising, I check whether the topic and the content have been clearly expressed.					1	2	3	4	5	6	7
Knowledge Rehearsal											
1. I write useful words and expressions taught in writing courses to help me remember.					1	2	3	4	5	6	7
2. I speak out useful words and expressions taught in writing courses to help me remember.					1	2	3	4	5	6	7
3. I read my class notes and the course material over and over again to help me remember.					1	2	3	4	5	6	7
Idea Planning											
1. I read related articles to help me plan.					1	2	3	4	5	6	7
2. I use the internet to search for related information to help me plan.					1	2	3	4	5	6	7
3. I think about the core elements of a good composition learned to help me plan.					1	2	3	4	5	6	7
Goal-Oriented Monitoring and Evaluating											
1. When I learn English writing, I set up goals for myself in order to direct my activities.					1	2	3	4	5	6	7
2. I check my English learning progress to make sure I achieve my goal.					1	2	3	4	5	6	7
3. I evaluate my mastery of the content in writing courses.					1	2	3	4	5	6	7
4. I monitor my learning process in writing courses.					1	2	3	4	5	6	7
5. When I am writing, I tell myself to stick to my plan.					1	2	3	4	5	6	7
6. I set up a learning goal to improve my writing.					1	2	3	4	5	6	7
Peer Learning											
1. I brainstorm with peers to help me to write.					1	2	3	4	5	6	7
2. I discuss with my peers to have more ideas to write.					1	2	3	4	5	6	7
3. I work with other students in writing courses.					1	2	3	4	5	6	7
Feedback Handling											
1. I am open to peers' feedback on my writing.					1	2	3	4	5	6	7
2. I am open to teachers' feedback on my writing.					1	2	3	4	5	6	7
3. I try to improve my English writing based on peers' feedback.					1	2	3	4	5	6	7
4. I try to improve my English writing based on teachers' feedback.					1	2	3	4	5	6	7
Interest Enhancement											
1. I look for ways to bring more fun to the learning of writing.					1	2	3	4	5	6	7
2. I choose interesting topics to practice writing.					1	2	3	4	5	6	7
3. I connect the writing task with my real life to intrigue me.					1	2	3	4	5	6	7
4. I try to connect the writing task with my personal interest.					1	2	3	4	5	6	7
Motivational Self-Talk											
1. I remind myself about how important it is to get good grades in writing courses.					1	2	3	4	5	6	7
2. I tell myself that I need to keep studying to improve my writing competence.					1	2	3	4	5	6	7
3. I tell myself that it is important to practice writing.					1	2	3	4	5	6	7
4. I pay much attention to writing courses to learn more.					1	2	3	4	5	6	7
5. I tell myself to practice writing to get good grades.					1	2	3	4	5	6	7
6. I persuade myself to work hard in writing courses to improve my writing skills.					1	2	3	4	5	6	7
7. I persuade myself to keep on learning in writing courses to find out how much I can learn.					1	2	3	4	5	6	7
8. I tell myself that I should keep on learning to write.					1	2	3	4	5	6	7
Emotional Control											
1. I tell myself not to worry when taking a writing test.					1	2	3	4	5	6	7
2. I tell myself to keep on writing when I want to give it up.					1	2	3	4	5	6	7
3. I find ways to regulate my mood when I want to give up writing.					1	2	3	4	5	6	7

Appendix B. The L2 Writer Self-efficacy Scale (L2WSS)

Not at all true of me	Not true of me	Slightly not true of me	Neutral	Slightly true of me	True of me				Very true of me		
1	2	3	4	5	6				7		
Linguistic Self-efficacy											
1. I can correctly use parts of speech (e.g., nouns, verbs, adjectives, etc.) in writing.					1	2	3	4	5	6	7
2. I can write a simple sentence with grammatical structure.					1	2	3	4	5	6	7
3. I can write compound and complex sentences with grammatical structure.					1	2	3	4	5	6	7
4 I can write a composition with a clear organisation or structure.					1	2	3	4	5	6	7
5. I can revise wordy or confusing sentences of my writing.					1	2	3	4	5	6	7
6. I can revise my composition to make it better organized.					1	2	3	4	5	6	7
7. I can revise basic grammar errors in my writing.					1	2	3	4	5	6	7
Self-regulatory Efficacy											
1. I can realise my goal to improve my writing.					1	2	3	4	5	6	7
2. I can think of my goals before writing.					1	2	3	4	5	6	7
3. I can think of different ways to help me to plan before writing.					1	2	3	4	5	6	7
4. I can evaluate whether I achieve my goal in writing.					1	2	3	4	5	6	7
5. I can evaluate my strength and weakness in writing.					1	2	3	4	5	6	7
6. I can evaluate whether a composition is good or bad.					1	2	3	4	5	6	7
Performance Self-efficacy											
1. I can understand the most difficult material presented in writing courses.					1	2	3	4	5	6	7
2. I can understand the basic concepts taught in writing courses.					1	2	3	4	5	6	7
3. I can understand the most complex material presented by the instructor of writing courses.					1	2	3	4	5	6	7
4. I can do an excellent job on the assignments in writing courses.					1	2	3	4	5	6	7
5. I can master the writing knowledge and strategies being taught in writing courses.					1	2	3	4	5	6	7
6. I can use the writing knowledge and strategies being taught in writing courses.					1	2	3	4	5	6	7
7. Considering the difficulty of the writing course, the teacher, and my skill, I can perform well in writing courses.					1	2	3	4	5	6	7

Appendix C. Writing Topics

Topic A

Prompts: Smoking is a major cause of serious illness and death throughout the world today. In the interest of public health, governments should ban cigarettes and other tobacco product. Do you agree or disagree?

Write a composition of more than 200 words on the following topic: *Should governments ban cigarettes and other tobacco product?*

Topic B

Prompts: Nowadays the Internet has become part of people's life, and millions of young people have made friends online.

Write a composition of more than 200 words on the following topic: *Is It Wise to Make Friends Online?*

Topic C

Prompt: It is recently reported in a newspaper that six students who shared a dorm at a local university hired a cleaner to do laundry and cleaning once a week. And each of them paid her 60 yuan a month. This had led to a heated debate as to whether college student should hire cleaners.

Write a composition of more than 200 words on the following topic: *Should College Students hire Cleaners?*

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