Facilitating Learners' Self-Regulated Learning Skills and Self-Efficacy to Write in English Using Technologies

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Abstract

The purpose of this quasi-experimental research was to study the effects of self-regulated strategy development (SRSD) instruction with explicit generalization training prompted by Constructivist Self-regulating Virtual Composing Activities (CSRVCA) on students' reported use of self-regulatory strategies, their self-efficacy to write and writing performance. The sample group in this study was 86 high school students who were selected through the use of convenience sampling, then 44 students was assigned to a control group and 42 students were in an experimental group. The students from the experimental group received regular writing class integrated with constructivist virtual writing instruction, while those from the control group received regular writing class, required by the school curriculum and syllabus. Instruments included surveys, writing tests and students' reflective journal. Data were collected through semi-structured interviews and reflective journals to triangulate quantitative results. The results revealed that the students from the experimental group had a significantly higher level of deploying self-regulatory strategies than those in the control group. They also had a higher level of perceived writing self-efficacy than the students in the control group. Although both groups showed improvement in writing scores, the experimental group outperformed the students in the control group in the post and the delayed post-tests.

Keywords: *Constructivist approach, self-regulation, writing, generalization*

INTRODUCTION

The self-regulated learning (SRL) was rooted from educational psychology, and later the notion has been applied to the field of language education (Mahmoodi, Kalantarib, & Ghaslanic, 2014). The approach has gained significant attention in research studies during the past few decades as a crucial factor of student academic and social-emotional competence, especially for schools and higher education (Graham & Harris, 2005; Zumbrunn et al., 2011; Benbenutty, Cleary & Kitsantas, 2014; De la Fuente et al., 2015). Self-regulated learning is referred to as a learning process in which an individual actively set learning goals, direct and regulate motivation, cognition and behavior to acquire skills or information during the learning process (Pintrich, 2004). Based on research review, competent self-regulated learners are confident to devise strategic plans to achieve self-set goals. They also regularly monitor and evaluate their goal progress ((De Bruin, Thiede & Camp, 2011) and seek feedback to adapt learning strategies to further optimize their learning achievement (Zimmerman, 2000; Zumbrunn et al., 2011).

It is suggested by research that the cognitive, affective and motivational strategies that learners employ to regulate their learning such as self-efficacy should also be investigated because they might influence learners' performance and attitudes (Cera et al., 2013; Benbenutty et al., 2014; Smit et al., 2017). The study conducted by Schunk & Zimmerman (2008) demonstrated that self-regulatory learning is positively related to self-efficacy beliefs. The more self-efficacy beliefs the individual possesses, the higher they employ self-regulation strategies in which it may contribute to academic success (as cited in Stephanou & Mpiontini, 2017). Zimmerman and Bandura (1994) discovered that highly-efficacious writers tended to achieve more satisfying academic achievements and become a critical self-evaluator. According to Pajares (1996), self-efficacy helps to enhance learners' academic abilities and achievement of their learning goals. Low self-efficacy plays a central role in sufficient mastery experiences, self-modelled experiences, forms of persuasion, and physiological levels such as understanding and distress (Schunk & Usher, 2011). Thus, it is crucial to investigate how these variables of motivation and self-efficacy influence learners' use of self-regulated learning (SRL) strategies in fostering proactive learning in EFL contexts.

Computer technology in EFL settings has been viewed as a supportive tool, and it has promoted a great influence on language teaching and learning. In this era of globalization, we cannot escape technology because it has permeated our lives and the educational system (Katemba, 2021.) Blake (2000) recommends that the integration of technology can enhance learning processes due to several features of computers that are considered to facilitate writing development. Keyvanshekouh (2012) and Sun (2014) revealed that Moodle is instrumental for EFL learners' proficiency and achievement in education (Alavi & Keyvanshekouh, 2012). In addition, Tools and features in Moodle can facilitate learners to acquire knowledge and skills, and to generalize what they learn in other settings (Nedeva et al., 2010).

The effectiveness of using technologies like Moodle in the educational setting does not depend so much on the technology itself but how it can be utilized to provide a quality learning experience. The New South Wales (NSW) Quality Teaching Model proposes "generic qualities of pedagogy that have been successfully implemented in different educational contexts and are demonstrated to improve student learning" (NSW DET, 2003, p. 4-5). These qualities are divided into three aspects: intellectual quality, quality learning environment, and significance for the learners.

One way that these concepts can be achieved is through the use of constructivist learning activities. In constructivist environments, the function of new technologies can enhance and facilitate learning (Sejzi & Aris, 2012). In online environments, learners can benefit in terms of increasing their motivation, engagement, collaboration and confidence (Costley, 2014). According to Godzicki et al. (2013), one of the advantages of appropriate use of technologies in classroom environments is that both learners' motivation and inclusion are fostered and supported. As a result, when learning involvement and participant occurs, students tend to make meaning and construct their own understanding of complicated concepts (Futurelab, 2009).

It is assumed that technology has an impact on learner motivation and self-regulation. Therefore, it is expected that students' behaviors will be affected by the use of virtual learning context as their motivation and behavior will be different if they were taught in the instructional approach and learning setting that makes them feel engaged and motivated (Francis, 2017).

However, to the best of researcher's knowledge, there was a small number of empirically supported interventions developed for the suburban high school youth, particularly those targeting self-regulation and motivation in Thai high school context. Due to the gap in the literature, this study examined the effectiveness of the instruction to promote the writing performance and self-regulatory skill of students in a suburban high school context.

LITERATURE REVIEW

Self-regulated learning (SRL) and writing

In order to develop learning process to achieve academic goals, it is very necessary for learners to develop self-regulation learning skills in educational context. In self-regulated learning (SRL), it involves three aspects of learning processes including metacognition, motivation and behaviour (Panadero, 2017).

It is mentioned that to be able to be a proficient writer, it requires an individual to possess a high level of self-regulation skills (Zimmerman & Riesemberg, 1997 as cited in Türkben, 2021). Studies have shown that self-regulation has characteristics of successful writer (Graham & Perin, 2007; Harris et al., 2011; Adaros, 2017). According to Oxford (2017), the SRL approach consists of essential components which result in developing academic writing performance and knowledge. It supports an integrated approach to writing instruction instead of applying only single writing method. This is because the SRL approach presumes that textual products, cognitive processes, and sociocultural aspects of writing are mutually depend on each other (Kern, 2000).

Studies revealed that there are positive relationships between the SRL writing interventions, level of SRL skills and improvement of writing quality, especially those with poor writing skills. Moreover, the students who participated in SRL writing interventions seemed to demonstrate higher motivation for writing when compared to those taught without SRL writing interventions (Graham & Perin, 2007; Harris et al., 2011; Akhmedjanova, 2020). It is, therefore, SRL in writing instruction has been recognized as one of the important areas of studies within educational psychology.

Ertmer and Newby (1996) proposed a model of the metacognitive processes that may be employed by self-regulated learners. Two core elements are included in this model, which are metacognitive knowledge and metacognitive control (See Figure 1).

For metacognitive knowledge, it covers (1) an awareness of task requirements and related strategies to achieve the task and (2) an awareness of their own personal resources, including knowledge of previously learned cognitive, motivational, and environmental strategies that can be used in the task.

Regarding the second element, metacognitive control, there are three interactive processes: (1) the development of a plan of action, (2) self-monitoring of progress and performance, and (3) self-evaluation of performance (e.g., "Did I write well?") and the effectiveness of the plan itself (e.g., "Did my writing plan help me to remember how to write effectively?"). Moreover, Ertmer and Newby (1996) pointed out that reflective thinking is also important for evaluating performance and revising plans for improvement. Learners are not able to use their metacognitive skills that would allow them to be able to master their foreign language learning autonomously (Pressley & Harris, 1990).

Thus, learners who cannot make writing knowledge transfer may not possess metacognitive awareness in any of the areas described by this model. The continuous utilization of behavioral or cognitive strategies may not increasingly enhance the ability of generalization when learners do not possess self-regulated learning skills.

Many studies have shown that metacognition encourages students to develop their own learning regulation through planning objectives, adopting learning strategies, directing their own learning progress, leading to their learning success (Winne & Nesbit, 2010; Kostaridou-Efklides, 2011; Dimmitt & McCormick, 2012; Efklides, 2014). This is consistent with Zimmerman's model (1990) who states that the important elements of metacognitive influences refer to setting objectives, managing, self-monitoring, and self-assessing.

Similarly, the elements are similar to those contained within the regulatory component of expert learning proposed by Ertmer & Newby (1996). While motivational and behavioral aspects indicated by Zimmerman (1990) are almost the same as the motivational and environmental aspects, Ertmer and Newby (1996) have expanded his strategies to incorporate those of cognitive aspects. In this model, a learner's conscious awareness of the three strategies is grouped into the knowledge aspect of metacognition, but the model accepts Zimmerman's principle that this knowledge is used by an expert learner during the regulation process.

Besides, to gain deeper insight into metacognition, studies often explore both aspects of self-regulation and metacognition together (Efklides, 2011; Zimmerman & Schunk, 2011), and Puustinen and Pulkkinen (2001) asserts that metacognition is recognized as one of the core elements in self-regulated learning because learner employs metacognition it to help regulate their own cognitive processes while learning (as cited in Stephanou & Mpiontini, 2017).

Self-regulated learners mean individuals who change, and sustain effective learning habits by utilizing these three strategies: metacognition, motivation, and behavior (Zimmerman, 1990), apply suitable learning strategies (Meltzer, 2007), assess their learning progress (De Bruin, Thiede & Camp, 2011), possess high self-efficacy (Labuhn et al., 2010), and plan goals and flexibly change approach (Wolters, 2011). For instance, when self-regulated learners begin a new task, they combine their knowledge of personal learning strengths and weaknesses, the requirements of the task, and previously successful learning strategies in order to create and apply a strategy to achieve the task. In the present study, self-regulation refers to the youth's ability to generate and deploy strategies for automatically generalizing newly learned writing skills.

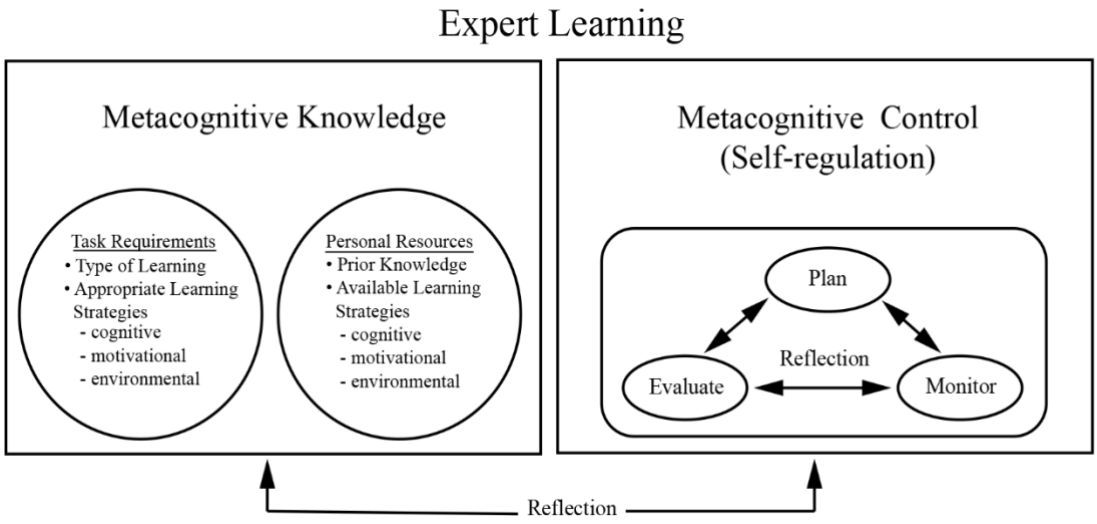

Figure 1: *Major Components of Expert Learning (Ertmer and Newby, 1996)*

To successfully regulate the learning process, an expert learner is capable of choosing and regulating strategies in each of these groups. Thus, the researcher integrated the strategy lists of Zimmerman (1990) with that of Ertmer and Newby (1996) in this study. The four components included in this study were metacognitive, cognitive, motivational and environmental strategies to investigate their usefulness to enhance self-regulated learning during the phase of virtual writing intervention.

Constructivist Approach

The researcher proposes that integrating constructivist strategies with specially-designed instruction to promote self-regulated learning will result in improving the efficiency of generalization. This is because this approach focuses on three key characteristics: contextual learning, language knowledge construction and social contexts for learning a language. (Ally, 2004).

Constructivist intervention in writing training focuses on "writing to learn" not "learning to write". The constructivist approach suggests that learning is the learners' construction of their own knowledge based on their experiences (Isik, 2018).

That is to say students' prior knowledge and experiences are the starting point for new learning because both are viewed as facilitators of new ideas and experiences, and later they may be transformed during learning (Cochran et al., 1993). Thus, this approach views the learner as an active and self-regulating individual. Learning is an active process in which learners are supported to construct their own meaning based on their experiences and fully participate in their own learning process (Francis, 2017).

Instead of spotlighting only the products of writing training (i.e., correctness of sentence structure and grammatical skills) and providing evaluative feedback, the proposed approach concentrates on the development of the cognitive and metacognitive processes to enhance self-regulated generalization. This means that instead of only improving learners' proficiency with writing targets, learners are motivated to seek and later they may acquire how they can apply relevant writing techniques in other writing situations (Martin & Rose, 2008; Rindskopf &

Ferron, 2014). When learners acquire how to write successfully and effectively, they are more likely to apply the knowledge in different writing situations without external assistance.

The underlying theoretical framework in instructional design of CSRVCA

The underlying theoretical framework in instructional design of constructivist self-regulating virtual composing activities (CSRVCA) is constructed within an integration of (a) constructivist learning theory (Duffy & Cunningham, 1996); (b) social cognitive theory (Bandura, 1997; Zimmerman, 2002) and (c) a model of the metacognitive processes (Ertmer & Newby, 1996).

The instructional goals in the design of virtual activities are taken from Duffy and Cunningham (1996 as cited in Reed et al., 2008). The design goals for constructivist approach include: (1) All knowledge is constructed; all learning is a process of construction (2) Many world views can be constructed: hence there will be multiple perspectives (3) Knowledge is context dependent, so learning should occur in contexts to which it is relevant (4) Learning is conducted using tools and signs (5) Learning is an inseparably social-dialogical activity (6) Learners are distributed, multidimensional participants in a socio-cultural process, and (7) Knowing how we know is the ultimate human accomplishment. Based on self-regulation theory and social cognitive theory, the self-regulated strategy development (SRSD) is composed of six recursive stages containing improving and stimulating background knowledge; discussing; modelling; memorising; support; and independent performance (Milford & Harrison, 2010). Informed by a model of the metacognitive processes (Ertmer & Newby, 1996), three key features included in the design of virtual activities were metacognitive knowledge (awareness-raising), metacognitive control (planning of action, self-monitoring and self-evaluation of performance), and self-reflection.

In this study, each self-regulatory strategy also included the specific writing tasks and learning goals as recommended by Cohen and Macaro (2007 as cited in Mizumoto, 2018) who paid attention on the characteristic of learning strategies based on different tasks and settings. They argued for the concrete and specific feature of learning strategies based on different tasks and settings. For instance, during the instruction of text-analysis strategies, the intervention also integrated some sub-strategies such as POW (pick my idea/organize my notes/writing and say more) for planning and composing; TREE (topic sentence/reasons/explain/ending) for organizing the structure of a written draft (See Table 1 in Appendix 1). For instance, when students were asked to check their own writing, they were given a POW + TREE graphic organizer chart and self-evaluation worksheet to provoke their critical reflection on a written draft.

Components of the proposed steps of constructivist self-regulating virtual composing activities

The proposed steps of the activities consist of two key phases: (a) awareness-raising phase and (b) self-regulated development phase. However, lecturers may find that learner motivation and/or metacognitive abilities require repeated attention throughout the intervention. In these cases, the sequence of activities can be adapted to meet specific goals as needed (See Table 1 in Appendix 1).

Phase I: Awareness-raising

This phase consists of a) awareness of the advantages of generalization and acceptance of the goal of generalization, b) awareness of the obstacles for generalization, c) awareness of

personal learning resources. The first intervention step of awareness-raising was conducted on Moodle site. The two techniques employed in this study were guiding questions together with discussion among peers and metacognitive modelling. The first practice includes asking students to be involved in activities that help them develop metacognitive awareness. The second practice relates to explicitly modelling transfer-focused thinking to develop metacognitive thinking.

To enhance the awareness of the advantages and the acceptance of goal of generalization, students are encouraged to examine where and how they will be asked to write such as for their intended majors and/or careers. Students are encouraged to transfer in two methods (Gorzelsky et al., 2017). The first activity helps cultivating involvement and motivation as Bergmann and Zepernick (2007) explained that many students paid attention to compulsory courses and career preparation. The second involves helping students understand how the concepts and skills they are developing in writing courses are preparing them to achieve their goals in future contexts, a form of implying what they have learnt to enhance transfer (National Research Council, 2000).

For the awareness of the obstacles that impede students' success in generalization, sample questions employed for group discussion to identify obstacles are: "Who do you write for the most?" "How do you feel when you write?" "Why is that?" and "When is it hardest to write—when you write to me, to your friends, or to your teachers? Why?"

After the obstacles to generalization have been identified, the student's personal learning resources can be considered as useful strategies. The researcher employed guiding questions to help the students themselves to identify and apply their previous experiences and learning strategies to new writing situations. The sample questions used in this study include "What do you do when you really want to write something?" or "If I asked you to write a message to your teacher today, what would you write to him/her?".

This can facilitate the lecturer to guide students in fostering and increasing metacognitive awareness in writing, flexibility and serve as a linkage of the instruction to other efforts to strengthen generalization in new writing contexts.

Phase II: Self-regulated development

The activities in the intervention in this phase contain six main steps integrating strategy planning, learning strategies, self-monitoring of performance and outcome, self-evaluation of performance and plan, and critical reflective thinking through the use of authentic tasks. Table 2 shows the six recursive processes of the SRSD model (Graham and Harris, 1996) with modification (Appendix 1).

Application of social cognitive model and constructivist approach to design CSRVCA in Moodle

Based on Social Cognitive theory, self-regulated learning (Zimmerman, 2002) is viewed as mutual interactions between learners' personal disposition and their environment (community, tools, rules), mediated by behaviour (enacted outcomes). The personal disposition itself consists of commitment to goals, strategies, and self-efficacy perceptions. All components of personal disposition interact with the externally revealed behaviour and environment and are affected by these factors.

In the constructivist approach, the learning environments are technology-assisted and help language learners use their cognitive skills specified in Bloom's taxonomy (Kaya, 2015). Wilson (1996, p. 5) explained that this learning context may facilitate learners to collaborate and assist each other through utilizing various available tools and information resources in order to achieve learning targets. This means that learning should be achieved not only through oral and written communication, but also through the use of additional media such as video, computer, photographs and so on to provide rich experiences.

In this study, Moodle was the platform used for facilitating constructivist self-regulating virtual composing activities. In order to investigate the effects of these learning behaviours such as metacognitive strategies, cognitive strategies, and motivational strategies, Moodle's features were considered to apply these behaviours. The constructivist self-regulating virtual composing activities thus included: (1) a bulletin board discussion space in Moodle which is used for students to post messages, questions, arguments, responses and requests for help from the lecturer or classmates and (2) a chat room in Moodle which is used for structured group discussions on their drafts among teams and (3) a chat room for a specific group of students to interact with the lecturer. In addition, Moodle allowed the lecturer to either present learning materials in word-processed or pdf documents, spreadsheets, images, or audio and video clips or design their own scaffolding activities to help students in applying the appropriate cognitive strategies.

The draft feature in Moodle also allowed students to edit their responses until the deadline and submit the final written work. In this study, students regularly reviewed their written drafts, possibly engaging in different types of metacognitive processes which were very important for the self-evaluation of their learning processes. Finally, the researcher added an online revising and editing checklist in order to solve one of the major problems to a successful learning: the lecturer's inability to spend sufficient time evaluating and providing quality feedback. Virtual peer discussion was easier and less time-consuming than teacher-centred feedback.

For the environmental factor, the applicability and functionality of Moodle provided a valuable environmental influence on the facilitation and application of learning behaviours. In order to facilitate students' maintenance and generalization effects of the virtual environment and investigate the impacts of learning behaviours and environmental factors such as peers' and lecturers' feedback, the virtual composing activities included two features: (1) an information channel for students to submit and revise tasks or review each other's drafts and (2) a forum for the lecturer to announce assignments and requirements and students to post information and demonstrate their opinions about the course and the virtual composing activities. In addition, the lecturer could control the deadline and timeframes for assignments, quizzes, forums and chats.

On the Moodle course home page, the lecturer could effectively arrange and manage the learning process such as announcing written tasks, asking for peer review and feedback, posting review and feedback and maintaining students' written files. In Moodle, students submitted their assignments, reviewed others' works and revised their assignments based on their received feedback. For the peer-reviewing process, Moodle could be used to randomly assign one reviewer to each student. The assigned reviewer could rate and provided feedback on another student's assignment in Moodle. Students received feedback from their peers and revised their tasks based on the received feedback. The lecturer was also able to grade and provide feedback to students' works via Moodle. Thus, the aims of this research are to investigate:

- how the experimental group and the control group differ in writing test scores at the post-test and the delayed post-test,
- how participants from the two groups differ in the use of four dimensions of self-regulatory strategies at the post-test, and
- how participants from the two groups differ in their self-efficacy at the post-test.

METHODS

Research design

The observational and quasi-experimental research design were used in this study to facilitate self-regulated EFL writers to achieve writing knowledge transfer from the perspectives of self-regulatory strategies, self-efficacy and writing performance. A mixed-methods approach involving self-report surveys, writing tests, student interviews and student reflective journals was used in this study.

Research participants and sampling procedures

Participants (n = 86) were voluntarily recruited from four intact classes in high school using convenience sampling. They were in grade 12 and had developed a certain degree of writing and language knowledge. All the participants were comparable in terms of period in English learning, age and educational background. They reported that they had never received any process writing or self-regulatory writing instruction. Among these students, there were 49 female students (56.97%) in the experimental group and 37 female students (43.03%) in the control group. The average age of these students was 17.58 (SD = .677), with approximately nine years of English learning experience (M = 11.17, SD = .654).

Research Procedures

Before the intervention period

At the start of the semester, all participants from both groups completed the Constructivist Self-regulated Learning in Writing Survey (CSLWS) to gain data on the use of self-regulatory strategies and self-efficacy in EFL witting. A purposive sampling was used to keep representative and informative about the research. Participants took around 25 minutes to complete the whole survey. A similar survey was administered at the end of the implementation as the result of the post-test. Writing tests with three different topics were administered to students at the beginning, the end of and one month after the implementation to follow up whether there is any development in writing performance.

The intervention period

Participants in the experimental group received the 18-week self-regulated strategy development (SRSD) instruction with explicit generalization training prompted by CSRVCA. Participants in the control group received regular writing courses, required by the school curriculum and syllabus (18-week, twice a week with 4 hours). In order to guarantee the comparability of the two conditions, both groups used the same contents and have the same in-and-after class writing tasks as well as the same day of instruction.

Data Collection

Constructivist Self-regulated Learning in Writing Survey (CSLWS)

CSLWS was self-report surveys which were employed to assess two variables regarding the current situation of students' self-regulatory strategies and self-efficacy.

Semi-structured interviews

In this study, interviews were administered to two students from the experimental group regarding their perceptions of CSRVCA course, their use of self-regulatory strategies and their self-efficacy. Data obtained were employed to triangulate the quantitative data and to investigate how SRSD instruction with explicit generalization training prompted by CSRVCA affected students.

Writing tests

In this study, students were required to complete a given-topic argumentative essay of at least 200 words based on the prompt (e.g., title of the topic and information outline) within 60 minutes. Writing topics were designed as general, culturally inoffensive and familiar to participants' daily life with the same difficulty to guarantee the fairness to every student.

Student reflective journals

Two case study students were selected from students in the experimental group based on their writing proficiency: one low and one high proficiency student. They kept reflective learning journals during the intervention to record changes regarding their attitude towards the CSRVCA course, their understanding and deployment of self-regulatory strategies and development of self-efficacy. They kept journals weekly from the start to the end of the intervention. By the end of the experimental study, the researcher collected copies of these journals and returned the original ones to participants. In total, the high writing-proficiency student completed three writing journals and the low writing-proficiency student completed two writing journals.

Validity and Reliability

Constructivist Self-regulated Learning in Writing Survey (CSLWS)

All the students completed a developing survey (CSLWS) in Thai. The survey was composed of three sections: 1) demographic information, 2) students' self-regulatory strategies and 3) self-efficacy in EFL writing contexts.

The first section aimed to collect participants' demographic data in terms of their years of English learning, age and grade. The second section was the Self-regulated Learning in writing Survey (SLWS) with 41 items examining students' deployment of self-regulatory strategies in terms of cognition, metacognition, motivational and environmental aspects. The final part of tool, validated during the preliminary phase, covered the three areas of language, self-regulation and writing performance (Woottipong, 2020).

For the second part of the 47-item survey, three specialists in the field of in L2 writing and SRL were invited to check the initial draft of the survey. The specialists must rate the statements on a five-point scale from "very low" to "very high". The value of IOC was between 0.6-1.0. The items with the lowest rating (6 items) were deleted. The revised survey was administered to six EFL students for clarity and readability. The finalized survey consisted of 41 items and a 5-point Likert scale with rating from 1 to 5 was employed to explore the trait

characteristics of self-regulatory strategies. For this study, the internal-consistency coefficient alpha of the SLWS was .90 based on a pilot study.

For the third section, a constructed 25 items focus on the three aspects of knowledge, behaviour, and regulation adapted to learning in L2 writing. The instrument was designed with a 5-point Likert scale. Three specialists in L2 writing or educational psychology were invited to assess the initial item list. The specialists must rate the statements on a five-point scale from "very low" to "very high". The value of IOC was between 0.6-1.0. The items with the lowest rating (7 items) were deleted. The revised survey was administered to six EFL students for clarity and readability. In this pilot test, the internal-consistency coefficient alpha of the final version of the survey was .92.

Writing test

Students' writing performance was measured using an argumentative paragraph with a given topic. All participants were required to write an argumentative paragraph with at least 200 words within 60 minutes during the Reading and Writing class V. The time limit was one hour and the minimum requirement was 170 words. The overall quality of these essays was marked based on Jacobs et al. (1981) ESL Composition Profile. The weighting assigned to each rating scale of each aspect of writing was adapted as per the suggestion of language specialists in terms of content (30%), grammar (language use) (30%), vocabulary (10%), organization (20%) and Mechanics (10%).

During the pilot phase, a total of 318 essays were gathered. In the pilot phase, the intra-rater coefficient for the first rater was $r = .87$, $p < .001$ and for the second rater was $r = .89$, $p < .001$ and their inter-rater reliability between the raters was $r = .84$, $p < .001$, indicating satisfactory reliability. The high correlations more than the threshold value of .80 showed that both raters were measuring the writer's performance consistently (Hamp-Lyons, 1990). Then they were given the remaining writing samples to evaluate separately.

Data Analysis

For the quantitative data, Independent-samples t-tests were used to investigate whether there were significant differences in self-regulatory strategies, self-efficacy and writing test scores between both groups at the pre-test. Then, a series of paired samples t-tests was used to investigate the possible changes of self-regulatory strategies and self-efficacy within each group between the pre- and the post-test. The effect of the intervention on students' use of self-regulatory strategies and self-efficacy were subjected to repeated measures of RM-ANCOVA. For the qualitative data collected from student reflective journals and student interviews, they were reviewed and transcribed by the researcher focusing on teaching practices, the instruction of writing strategies, classroom interactions and students' engagement.

RESULTS AND DISCUSSIONS

Comparison of baseline conditions at the pre-test

The bivariate analyses were used to compare the difference regarding self-regulatory strategies, self-efficacy and writing test scores between the experimental group and the control group. Social factor differences were also analyzed.

Social factor differences

Descriptive analyses showed that the average ages of students from the experimental group and the control group were MEXP = 17.95 (*SD* = .582) and MCON = 18.09 (*SD* = .603). Students from the two groups reported approximately 12 years of English learning experience MEXP = 11.48 (*SD* = 0.862); MCON = 11.64 (*SD* = 0.942). A series of independent samples t-tests was used to evaluate the social contextual differences between the two groups. Findings revealed no statistically significant differences among students in both groups regarding age and years of English learning experience (See Table 3). For Gender comparison, the result of a Chi-square test of independence showed no significant difference with χ 2 (1) = .744, p = .388.

Table 3

Results of Independent Samples t-tests of Age and Years of English Learning between the Experimental Group and the Control Group

Variables	Group	N	M	SD	t	p	95% CI	
							LL	UL
Age	EXP	42	17.95	.582	1.083	.371	-.116	.393
	CON	44	18.09	.603				
Year of English Learning	EXP	42	11.48	.862	.821	.103	-.228	.548
	CON	44	11.64	.942				

Writing test scores

Independent samples t-tests found no significant difference in the pre-test writing scores between the experimental group and the control group (see Table 4 in Appendix 2).

Four dimensions of self-regulatory strategies

Descriptive analysis revealed that the average mean scores of the eight self-regulatory strategies of the students in the experimental group and the control group fluctuated between 3 (not true of me) to 5 (slightly true of me). Independent samples t-tests revealed no significant differences in the deployment of all self-regulatory strategies between both groups at the pre-test (see Table 5 in Appendix 2).

Self-efficacy

No significant difference was found between the two groups in the three subcategories of self-efficacy that included linguistic self-efficacy, self-regulatory efficacy and writing performance self-efficacy (see Table 6 in Appendix 2). Based on the findings above, the statistical analyses showed that the two groups were comparable in terms of their social factors, four dimensions of self-regulatory strategies, self-efficacy and their writing performance before the implementation.

Results of writing test scores

The writing test scores of the experimental group after the treatment were significantly higher than the control group's scores with a large effect size at the post-test and the delayed post-test. The result indicated that students who had received the CSRVCA instruction seemed to achieve a better learning outcome in writing than students who received the regular writing course (See Table 7 in Appendix 2).

The writing scores of both groups had increased at the delayed post-test; however, the sustained positive influence was large for the experimental group but insignificant for the control group. The significant difference between the two groups at the delayed post-test can be inferred that the intervention contributed to a more consistent result for students' writing development than the regular writing course. The learning achievement indicated the positive influence of the intervention of CSRVCA on the enhancement of students' writing performance in EFL contexts.

The significant differences between the two groups at the post-test and the delayed post-test confirmed the transferability of the sustained influence of the intervention from L1 to L2 contexts. For the magnitude of the difference of the control group, it became small at the delayed post-test, while the result of the experimental group was still sustained suggesting that the effect of the four and a half months intervention did not wane after the intervention. In addition, the pre-test writing scores as a covariate explained a large portion of the variance between the two groups at the post and the delayed post-tests. To conclude, the positive results in this study confirmed the effectiveness of CSRVCA instruction in promoting EFL outcomes as it did in L1 settings. The findings supported the influence of social cognitive theory, a model of the metacognitive processes in the learning process, the on-going development of the SRSD model and the constructivist approach.

Results of metacognitive, cognitive, motivational and environmental strategies

The experimental group displayed significant development in utilizing four learning strategies between the pre- and post-tests, while there was no significant difference for the control group (See Table 8 in Appendix 2). It can be inferred that after the intervention, the experimental group had a better understanding of the strategies and tended to utilize them more frequently. Another plausible reason might be that the virtual composing activities encouraged students to acquire new content knowledge and the targeted SRL strategies with sufficient lecturer scaffolding and peer collaboration. This might have enhanced the students' engagement in and perceived value of writing tasks.

Results of the interviews emphasized that the treatment enhanced the students' willingness and capability to deploy SRL strategies, particularly metacognitive strategies. In addition, the reflective journals and interviews showed that the developments were the effect of the integration of self-regulated process in the virtual composing activities.

Cognitive strategies

The results of the RM-ANCOVA demonstrated that there was significant difference between the two groups in the use of text analysis, $F (1, 84) = 4.351$, $p = .040$, partial eta-squared ($\eta p2$) = .049 and rehearsal and mnemonics, $F (1, 82) = 5.568$, $p = .021$, partial eta-squared ($\eta p2$) = .062. However, the covariate was significantly related to the use of these two strategies at the post-test with $F (1, 83) = 4.87$, $p = .030$, partial eta-squared ($\eta p2$) = .055 for text analysis and $F (1, 83) = 10.367$, $p = .002$, partial eta-squared ($\eta p2$) = .111 for rehearsal and mnemonics.

This revealed that students' pre-existing level of using cognitive strategies had a small effect on the use of text analysis strategies (partial eta-squared ($\eta p2$) = .049) and a medium effect on rehearsal and mnemonics (partial eta-squared ($\eta p2$) = .042) (Cohen, 1988).

Although text analysis was the target strategy during the intervention, the significant difference was reported in both cognitive strategies for the experimental group at the post-test (See Table 8 in Appendix 2). One possible reason might be that the length of the treatment was long enough to contribute to a significant effect on the improvement of using language knowledge strategies.

Results also indicated that only the experimental group had a significant increase in using text analysis and rehearsal and mnemonic strategies between the pre-test and the post-test. It can be inferred that the students in the experimental group were more likely to spotlight text analysis and rehearsal and mnemonic strategies such as grammar, word or structures during and after the writing treatment. This showed that the instruction of cognitive strategies contributed to a positive effect on student performance and attitude towards the processes. This assumption is supported by previous research which found that appropriate use of virtual teaching has been shown to enhance English writing in the areas of grammar (Salaberry, 2001), pragmatics, and communicative competence (Zhao & Lai, 2008).

Metacognitive strategies

Results of RM-ANCOVA showed significant differences in planning and organizing, F (1, 84) = 10.838, p = .001, partial eta-squared (ηp2) = .114 and writing monitoring, F (1, 84) = 20.696, p < .001, partial eta-squared (ηp2) = .198 between the two groups.

The experimental group performed better in using these metacognitive strategies than the control group after the treatment (See Table 8 in Appendix 2). The clear positive influence of the treatment on the use of the metacognitive strategies indicated that the self-regulation instruction model, in its form as recursive procedures, may stimulate students' awareness, enhancing their understanding and encouraging the usage of the focused metacognitive strategies when they did a writing task similarly to what Harris et al. (2008) reported on L1 students. The findings of this study reveal preliminary evidence for the effectiveness of the instruction via virtual composing activities on nurturing Thai students' use of metacognitive strategies and self-awareness of regulating their own learning processes.

Environmental strategies

Results of RM-ANCOVA demonstrated that the group difference had a significant, moderate effect on peer discussion, F (1, 84) = 5.811, *p* = .018, partial eta-squared (ηp2) = .065 and help-seeking, F (1, 84) = 11.406, p = .001, partial eta-squared (ηp2) = .120 with a medium effect size.

As expected, the covariate was significantly correlated with participants' reported use of peer discussion *F* (1, 83) = 7.381, *p* = .008, partial eta-squared (ηp2) = .082 and help-seeking F (1, 83) = 16.069, *p* < .001, partial eta-squared (ηp2) = .162 at the post-test. This revealed that students' pre-level of using peer discussion and help-seeking strategies had a medium and strong effect on their use of these strategies in new learning or writing tasks at the post-test.

The experimental group students reported greater improvement in using peer learning strategies than the control group at the post-test (See Table 8). This suggests that the intervention helped these students develop a better understanding of the usefulness of peer checking. The peer discussion and cooperation then reinforce the reflective practice as they critically assess each other and themselves, through the process of participating in online discussions. This interaction seems to motivate their further learning. By providing a link

between past and future experience, reflective practice is viewed to possibly apply metacognitive knowledge to the changing contexts (Von Wright, 1992).

This study focuses on high school students and the extent to which the integration of constructivist approach and a social-cognitive approach can support the development of self-regulatory attributes and enhanced academic self-efficacy. According to Naylor and Cowie (2000), the key issue of developing an effective intervention strategy for students with learning difficulties is the importance of metacognition and the part played by the peer group. Social interaction with peers was found to promote effective thinking strategies and promoting metacognitive attributes. It is not just the encounter that brings about change but the internalization of this joint intellectual activity.

Motivational Strategies

Results of RM-ANCOVA demonstrated that the group difference had a significant effect on interest enhancement, F (1, 84) = 8.581, p = .004, partial eta-squared (ηp2) = 0.93 with a medium effect size. Significant difference was also found in performance and mastery self-talk between the two groups at the post-test, F (1, 84 = (9.516, p = .003, partial eta-squared (ηp2) = .102 with a medium effect size.

At the end of the instruction via CSRVCA, the students from the experimental group had an increase in utilizing two motivational strategies at the post-test, while the control group did not (See Table 8 in Appendix 2). This affirmed that students from the experimental group were found to apply more learning interest or performance and mastery self-talk after the eight-month intervention. The result might be the effect of the virtual composing activities based on the integration of SRSD and constructivist approach to teaching such as the cooperative assignment or group discussion. For example, the student wrote (reflective journal), "I like the way we are grouped together and time is given for discussions via Moodle". Another student said (interview) "I like the online group discussions. Everyone in my group gets to share our thoughts and learn from each other on the different aspects of argumentative writing". In addition, the findings might also be due to the intervention steps of awareness-raising in which the lecturer generated students' initial motivation by emphasizing the intrinsic value and the instrumental value of learning writing skills to the students (Dőrnyei & Ryan, 2015). In awareness-raising steps, the lecturer guided the students in stimulating metacognitive awareness in writing so that students acknowledged the need for the skills and then desiring to learn them to self-improve. When the student themselves see the need to acquire the skill, it serves as a link to apply the instruction to other efforts that promote generalization in new writing contexts.

Results of 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 (see Table 9 in Appendix 2).

The RM-ANCOVA showed a significant effect of covariate on the three subcategories with large effect sizes: covariate of language self-efficacy, F (1, 83) = 11.139, p = .001, partial eta-squared (ηp2) . =118; covariate of self-regulatory efficacy, F (1, 83) = 10.117, p = .002, partial eta-squared (ηp2) = .109; covariate of writing performance self-efficacy, F (1, 83) = 15.960, p < .001, partial eta-squared (ηp2) = .161.

Students in the experimental group had significant increases in writing self-efficacy, self-regulatory efficacy and writing performance self-efficacy at the post-test. This showed that after the treatment, the students in the experimental group were more confident in using writing knowledge and achieving writing tasks. Based on the constructivist theory, it might be explained that the mediation and scaffolding during the virtual composing instruction may have increased students' self-confidence in their task performance. Scaffolding is a one of the essential tools used by lecturers to facilitate this interaction (Lee, 2003 as cited in Zou & Thomas, 2018).

It might be explained that the steps in virtual composing activities emphasized the lecturer to initially provide high support for the assignment to be achieved, and then the instructional scaffolding in the virtual composing activities cautiously removed to encourage the learners to be independent. Scaffolding was important in online interaction, allowing the lecturer to lead the students to become more and more independent and therefore more confident in their interactions.

In this study, a virtual learning community is created to encourage students to construct new knowledge that is well-connected to other knowledge held by the students. In this way, the virtual composing activities turn to be student-centered learning in which the participants can virtually interact, work together, and share their own views about writings with peers. Students can have the chance to read their peers' language and give/receive feedback interactively. In terms of pedagogical purposes, CSRVCA in the writing learning process stimulate dialogue between the participants and the lecturer through the exchange of ideas out of class. To illustrate, the use of virtual composing activities increases reflectivity of learners and their strategy utilization when written language is produced via virtual activities. Due to the limited amount of allocated time to employ foreign language in the classroom, the use of virtual activities to stimulate and practice language out of class time is very beneficial for the EFL learners.

Apart from the significant difference in their efficacy level, some of the students mentioned the usefulness of peer feedback and publishing written materials via Moodle. The students explained that it is an important tool to help them write better. This result was explained by one of the students (interview):

> *"Because I know that I have to publish my written work in Moodle and my friends would give feedback, I have to do my best to write carefully. I planned and reviewed my writings before publishing and while typing."*

Receiving online peer feedback or constructive criticism facilitates learners to construct their writing work through revising drafts and making error corrections, tracking their progress on several drafts, thereby stimulating self-efficacy and motivation in L2 writing (Shudooh, 2003). Moreover, the proposed virtual composing activities provided a partially non-threatening learning environment because the virtual environment gives students more time to prepare content and consider responses carefully prior to writing. This helps students in developing language learning while reducing psychological barriers.

Besides practicing writing via virtual activities to help activate their writing efficacy, receiving peer feedback also increased their reflectivity and monitoring skills. This result is in line with Bartlett-Bragg's (2003) study in which he argued for the effectiveness of peer feedback through blogging. Based on the self-efficacy perspective, when learners perceive high self-efficacy,

they try harder and utilize the knowledge and skills they have (Kim & Lorsbach, 2005 as cited in Ewa et al., 2017). Therefore, due to the significant change in the writing self-efficacy levels of students, it is possible that the impact of peer feedback stimulated and motivated the students to develop their skills.

CONCLUSION AND SUGGESTIONS

The proposed steps in virtual activities designed to promote self-regulation for writing knowledge transfer were presented. The step primarily emphasizes stimulating students' motivation, metacognitive knowledge and self-regulation to achieve writing knowledge transfer. In the proposed steps, the lecturer played an important role to facilitate the achievement of the goals in each step. In phase I, the lecturer promoted learners' awareness regarding all aspects of generalization, while in the second phase, they proactively planned strategies for generalization during performance, monitor performance processes and outcomes, evaluate their performance and plan, and then use critical reflective thinking to adjust strategically to improve their performance in new situations or tasks.

Overall, it might be explained that students demonstrated improvements in writing competence and self-efficacy or confidence in deploying metacognitive knowledge and regulatory skills because they are given opportunities to use them in appropriate virtual learning environments and to receive informative, corrective feedback concerning their use. Students were aware of a variety of metacognitive, cognitive, motivational and environmental strategies that could be used in achieving the assigned writing tasks. In addition, extensive long-term practice of four and a half months and feedback are considered important for the development of effective learning. To enhance self-regulated learning, extensive practice is still needed for a learner to be able to automatically and effectively generalize effective learning strategies. Thus, extensive long-term practice and feedback are considered important for the development of expert learning (Horowitz, 2019).

This study has supported the socio cognitive view of SRL (Schunk, 2001), which spotlights the proactive engagement of self-regulating processes under the interaction of individual, behaviour and environments. This research collectively displays how human behaviour, the regulation of cognition and other personal factors worked as interacting elements of each other in the reciprocity loop, affecting learners' academic performance (Zimmerman, 2011).

In addition, the self-regulation model mirrors a constructivist teaching view of self-regulation, stressing the mentoring of a learner by more capable others (e.g., teachers, or peers). According to Schraw et al (2006), constructivist teaching methods and techniques develop intellectual abilities and self-regulated learning skills of students such as problem solving and critical thinking as in cooperative learning, etc. These findings demonstrate that constructivist approach in virtual practices can affect self-regulated learning skills of students that can control self-learning. Methods and strategies together with the process of active learning, and teaching styles such as learning via discussion, programmed learning, etc. influence self-regulated skills of learners. Positive effects have been revealed in self-regulated skills of learners who use their own knowledge and concepts, share their views with peers or teachers in a learning environment in which such methods and strategies are utilized (Altun & Erden, 2013).

This intervention in this study was designed to integrate many perspectives to explain what and how SRL strategies can be learned and taught more effectively in L2 writing contexts. The

exploration of the self-regulating process from two aspects of socio-cognitive and constructivist approaches is beneficial in assisting us develop deeper insight into how to foster development of self-regulated learners to attain lifelong learning strategies in L2 contexts.

For the limitations and further research, regarding the sample, this study used only upper secondary school students in Thai secondary schools. The findings cannot be generalized to other populations. Moreover, the intervention of this study only emphasized on argumentative writing tasks in virtual classroom environments. Thus, it is impossible to examine the influence of different text types on the effectiveness of strategy instruction. Further studies might examine whether different writing tasks and genres lead differently to learners' self-regulation development and their academic achievement. Besides, the lecturer acted as the researcher in this research, and this might have affected the way the participants' responses in the interviews and survey.

REFERENCES

Adaros, A. E. A. (2017). *The influence of self-regulation, motivation, proficiency, and gender on L2 first-year writing achievement*. [Doctoral dissertation]. Temple University, Philadelphia, USA. [Online URL: https://scholarshare.temple.edu/bitstream/handle/20.500.12613/692/AngelAdaros_temple_0225E_12820.pdf?sequence=1&isAllowed=y] accessed on January 10, 2022.

Akhmedjanova, D. (2020). *The effects of a self-regulated writing intervention on English learners' academic writing skills*. [Doctoral Dissertation]. University at Albany, New York, USA. [Online URL: https://media.proquest.com/media/hms/PFT/2/Zz0LG?_s=bt3RrsqYfPX0C%2FowHwr6uLumBpQ%3D] accessed on January 6, 2022.

Alavi, S., & Keyvanshekouh, A. (2012). Using the Moodle Reader as an extensive reading tool and its effect on Iranian EFL students' incidental vocabulary learning. *English Language Teaching*, *5*(6), 135-145.

Ally, M. (2004). Foundations of educational theory for online learning. In T. Anderson, & F. Ellouimi (Eds.), *Theory and practice of online learning* (pp. 3-31), Athabasca, AB, Canada: Athabasca University.

Altun, S., & Erden, M. (2013). Self-regulation based learning strategies and self-efficacy perceptions as predictors of male and female students' mathematics achievement. *Procedia-Social and Behavioral Sciences*, 106, 2354-2364.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares, & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-337). Greenwich, CT: Information Age Publishing.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman.

Bartlett-Bragg, A. (2003). Blogging to learn. Knowledge Tree e-journal. [Online URL: http://Knowledgetree.flexiblelearning.net.au/edition04/pdf/Blogging_to_learn.pdf] accessed on February 24, 2019.

Benbenutty, H., Cleary, T. J., & Kitsantas, A. (2014). *Applications of self-regulated learning across diverse disciplines*. Charlotte, NC: Information Age Publishing, Inc.

Blake, R. (2000). Computer-mediated communication: A window on L2 Spanish interlanguage. *Language Learning & Technology*, *4*(1), 120–136.

Cera, R., Mancini, M., & Antonietti, A. (2013). Relationships between metacognition, self-efficacy and self-regulation in learning. *Journal of Educational, Cultural and Psychological Studies*, *7*, 115-141.

Cochran, K. F., DeRuiter, J. A., & King, R. A. (1993). Pedagogical content knowing: An

integrative model for teacher preparation. *Journal of Teacher Education, 44*(4), 263-272.

Costley, K. C. (2014). The positive effects of technology on teaching and student learning. [Online URL: https://files.eric.ed.gov/fulltext/ED554557.pdf] accessed on December 20, 2021.

De Bruin, A. B., Thiede, K. W., & Camp, G. (2011). Generating keywords improves metacomprehension and self-regulation in elementary and middle school children. *Journal of Experimental Child Psychology, 109*, 294-310.

De la Fuente, J., Zapata, L., Martínez-Vicente, J. M., Sander, P., & Cardelle-Elawar, M. (2015). The role of personal self-regulation and regulatory teaching to predict motivational-affective variables, achievement, and satisfaction: A structural model. *Frontiers in Psychology, 6*, 399.

Dimmitt, C., & McCormick, C. B. (2012). Metacognition in education. In K. R. Harris, S. Graham, & T. Urdan (Eds.), *APA educational psychology handbook* (pp. 157-187). Washington, DC: APA.

Dörnyei, Z., & Ryan, S. (2015). *The psychology of the language learner revisited*. New York: Routledge.

Efklides, A. (2014). How does metacognition contribute to the regulation of learning? An Integrative Approach. *Psychological Topics, 23*, 1-30.

Ertmer, P. A., & Newby, T. J. (1996). The expert learner: Strategic, self-regulated, and reflective. *Instructional Science, 24*(1), 1-24.

Ewa, Ł., Magdalena C., & Agnieszka, S. (2017). Academic motivation in children with dyslexia. *The Journal of Educational Research,* 110(5), 575-580.

Francis, J. (2017). *The effects of technology on student motivation and engagement in classroom-based learning*. [Doctoral Dissertation]. University of New England. [Online URL: https://dune.une.edu/cgi/viewcontent.cgi?article=1120&context=theses] accessed on January 8, 2022.

Godzicki, L., Godzicki, N., Krofel, M., & Michaels, R. (2013). *Increasing motivation and engagement in elementary and middle school students through technology-supported learning environments*. [Unpublished Master's thesis]. Saint Xavier University.

Gorzelsky, G., Hayes, C., Jones, E., & Driscoll, D. L. (2017). Cueing and adapting first-year writing knowledge: Support for transfer into disciplinary writing. In Moore, J. L., Bass, R. (Eds.), *Understanding writing transfer: Implications for transformative student learning in higher education* (pp. 113-121). Sterling, WV: Stylus.

Graham, S., & Harris, K. R. (1996). Self-regulation and strategy instruction for students who find writing and learning challenging. In C. M. Levy, & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences, and applications* (pp. 347-360). Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc.

Graham, S., & Perin, D. (2007). A meta-analysis of writing instruction for adolescent students. *Journal of Educational Psychology, 99*, 445-476.

Hamp-Lyons, L. (1990). Second language writing: Assessment issues. In B. Kroll (Ed.), *Second language writing: Research insights for the classroom* (pp. 69–87). Cambridge, UK: Cambridge University Press.

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

Horowitz, G. (2019). *Teaching STEM to first generation college students: A guidebook for faculty & future faculty*. USA: Information Age Publishing Inc.

Isik, A. D. (2018). Use of technology in constructivist approach. *Educational Research and Reviews, 13*(21), 704-711.

Jacobs, H. L., Zingraf, S. A. Wormuth, D. R., Hartfiel, V. F., & Hughey, J. B. (1981). *Testing ESL composition: A practical approach*. Rowley, Massachusetts: Newbury House.

Katemba, C. V. (2021). Enhancing Vocabulary Performance Through Mobile Assisted Language Learning at a Rural School in Indonesia. Acuity: Journal of English Language Pedagogy, Literature and Culture, 6(1), 1-11.

Kaya, H. (2015). Blending technology with constructivism: Implications for an ELT classroom. *Teaching English with Technology*, *15*(1), 3-13.

Kern, R. (2000). *Literacy and language teaching*. Oxford, UK: Oxford University Press.

Kostaridou-Efklides, A. (2011). *Metacognitive procedure and self-regulation*. Athens: Pedio.

Labuhn, A. S., Zimmerman, B. J., & Hasselhorn, M. (2010). Enhancing students' self-regulation and mathematics performance: The influence of feedback and self-evaluative standards. *Metacognition and Learning*, *5*, 173-194.

Mahmoodi, M. H., Kalantarib, B., & Ghaslanic, R. (2014). Self-Regulated Learning (SRL), motivation and language achievement of Iranian EFL learners. *Procedia - Social and Behavioral Sciences, 98*, 1062 – 1068.

Martin, J. R., & Rose, D. (2008). *Genre relations*: Mapping culture. Equinox.

Meltzer, L. (2007). *Executive function in education: From theory to practice*. New York: The Guilford Press.

Milford, T., & Harrison, G. L. (2010). Using the PLEASE strategy with a struggling middle school writer with a disability. *Intervention in School and Clinic, 45*(5), 326-332.

Mizumoto, A. (2018). On questionnaire use in language learning strategies research. *The Journal of Asia TEFL, 15*(1), 184-192.

Naylor, P., & Cowie, H. (2000). Learning the communication skills and social processes of peer support: A case study of good practice. In H. Cowie, & D. V. D. Alsvoort (Eds.), *Social interaction in learning and instruction* (pp. 93-104). Oxford: Pergamon.

Nedeva, V., Dimova, E., & Dineva, S. (2010). *Overcome disadvantages of E-learning for training English as a foreign language*. [Paper presentation]. The 5th International Conference on Virtual Learning ICVL, University of Bucharest and University of Medicine and Pharmacy Târgu-Mures, Romania. [Online URL: http://www.icvl.eu/2010/disc/icvl/documente/pdf/tech/ICVL_Technologies_paper03.pdf] accessed on January 25, 2021.

New South Wales Department of Education and Training (NSW DET). (2003). *Quality Teaching in NSW Public Schools*. Discussion Paper. Professional Support and Curriculum Directorate, Sydney.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*(4), 543–578.

Pajares, F. (2007). Empirical properties of a scale to assess writing self-efficacy in school contexts. *Measurement and Evaluation in Counseling and Development, 39*, 239 –249.

Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontier in Psychology, 8*(422), 1-28.

Pressley, M., & Harris, K. R. (1990). What we really know about strategy and instruction. *Educational Leadership, 48*(1), 31-34.

Reed, P., Smith, B., & Sherratt, C. (2008). A new age of constructivism: 'Mode Neutral'. *E-Learning, 5*(3), 310-322.

Rindskopf, D. M., & Ferron, J. M. (Eds.). (2014). Using multilevel models to analyze single-case design data. In T. R. Kratochwill, & J. R. Levin (Eds.), *School psychology series. Single-case intervention research: Methodological and statistical advances* (pp. 221-246). American Psychological Association.

Salaberry, M. R. (2001). The use of technology for second language learning and teaching: A retrospective. *The Modern Language Journal, 85*(1), 39-56.

Schraw, G., Crippen, K. J., & Hartley, K. D. (2006). Promoting self-regulation in science education: Metacognition as part of a broader perspective on learning. *Research in Science Education, 36*(1-2), 111-139.

Schunk, D. H. (2001). Social cognitive theory and self-regulated learning. In B. J. Zimmerman, & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theoretical perspectives* (pp. 125–151). Mahwah, NJ: Erlbaum.

Schunk, D. H., & Usher, E. L. (2011). Assessing self-efficacy for self-regulated learning. In B. J. Zimmerman, & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 282–297). New York: Routledge.

Shudooh, Y. M. (2003). *The application of computers in writing classes*. [Doctoral Dissertation]. University of Cincinnati. [Online URL: http://www.rave.ohiol ink.edu/etdc/view?acc _ num= ucin 1 053095635] accessed on August 6, 2020.

Smit, K., de Brabander, C. J., Boekaerts, M., & Martens, R. L. (2017). The self-regulation of motivation motivational strategies as mediator between motivational beliefs and engagement for learning. *International Journal of Educational Research, 82*, 124-134.

Stephanou, G., & Mpiontini, M. (2017). Metacognitive knowledge and metacognitive regulation in self-regulatory learning style, and in its effects on performance expectation and subsequent performance across diverse school subjects. *Psychology, 8*, 1941-1975.

Sun, L. (2014). Investigating the effectiveness of Moodle-based blended learning in a college English course. *International Journal of Information Technology and Management, 13*(1), 83-94.

Türkben, T. (2021). The effect of self-regulated strategy education on the writing skills of middle school students. *International Journal of Education & Literacy Studies, 9*(2), 52-65.

Von Wright, J. (1992). Reflections on reflection. *Learning and Instruction*, 2, 59-68.

Wilson, B. G. (1996). *Constructivist learning environments: Case studies in instructional design*. Englewood Cliffs: Educational Technology Pub. Inc.

Winne, P. H., & Nesbit, J. C. (2010). The psychology of academic achievement. *Annual Review of Psychology, 61*, 653-678.

Wolters, C. A. (2011). Regulation of motivation: Contextual and social aspects. *Teachers College Record, 113*, 265-283.

Woottipong, K. (2020). Investigation into Thai high school learners' self-regulated learning skills, self-efficacy and writing performance. *Research in Pedagogy, 10*(1), 32-49.

Zhao, Y., & Lai, C. (2008). Technology and second language learning: Promises and problems. In L. Parker (Ed.), *Technology-mediated learning environments for young English learners: Connections in and out of school* (pp. 167-205). New York: Lawrence Erlbaum Associates.

Zimmerman, B. J. (2011). Motivational sources and outcomes of self-regulated learning and performance. In B. J. Zimmerman, & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 49–64). Mahwah, NJ: Erlbaum.

Zimmerman, B. J. (2000). Attaining self-regulation: A social-cognitive perspective. In M. Boekaerts, P. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Orlando, FL: Academic Press.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice, 41*(2), 64-70.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist,* 25, 3-17.

Zimmerman, B. J., & Bandura, A. (1994). Impact of self-regulatory influences on writing course attainment. *American Educational Research Journal,* 31, 845–862.

Zou, B., & Thomas, M. (2018). *Handbook of research on integrating technology into contemporary language learning and teaching*. PA: IGI Global Book.

Zumbrunn, S., Tadlock, J., & Roberts, E. D. (2011). *Encouraging self-regulated learning in the classroom: A review of the literature*. Metropolitan Educational Research Consortium (MERC), Virginia Commonwealth University.