

## **The Impact of Self-Regulatory Strategies on the Essay Writing of EFL Students with and without Attention Deficit Hyperactivity Disorder**

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**Abstract:** The complexity of self-regulatory strategies has been challenging to educational researchers who seek to find proper interventions that benefit students and teachers. This study has employed the Self-Regulatory Strategy Development (SRSD) model of instruction to help students monitor, evaluate and revise their writing. SRSD would be beneficial for adult students with learning disabilities in the procedure of essay writing. Attention Deficit Hyperactivity Disorder (ADHD) as a cognitive-behavioral dysregulation is a consequence of deficits in self-regulatory process. Many students with learning disorders such as ADHD have trouble in the mechanics and process of writing. The purpose of this study is to explore the effects of SRSD on the essay writing of EFL undergraduate students. This study tried to evaluate the effects of SRSD intervention on the essay writing of ADHD and NON-ADHD students. To fulfill the mentioned objectives, 126 EFL undergraduate students who enrolled in essay writing course at Tehran Azad University participated in this study. The results indicated that SRSD instruction had a significant effect on the essay writing of the EFL undergraduate students. Likewise, ADHD students could achieve a significant improvement after receiving SRSD intervention.

**Keywords:** Attention Deficiency Hyperactivity Disorder (ADHD), Self-regulation, Self-Regulatory Strategy Development (SRSD), Essay Writing.

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## Introduction

In our educational system, some students have been academically successful and some are facing problems in academic writing. Discovering why some students succeeded academically and others did not, has been the main concern of research for decades (Zimmerman, 2008). Following researchers' attempts to discover effective factors on students' improvements, self-regulation has been considered as an essential factor in the learning process of students (Jarvela & Jarvenoja, 2011; Zimmerman, 2008).

The present study focused on the self-regulatory learning in the writing process of undergraduate students with "Attention Deficit Hyperactivity Disorder" (ADHD) as a critical aspect of learning deficiency. Self-regulatory strategies could facilitate writing challenges of all students and in particular students with ADHD. The results of different researches indicated that self-regulatory strategies enhanced the students' writing ability (Zimmerman & Bandura, 1994) by improving their cognitive strategies, metacognition, motivation, task engagement and social support (Pintrich & De Groot, 1990, Pintrich, 2000; Zimmerman & Kitsantas, 1999). If students could receive proper instructions, they would take the responsibility for their writing improvement even with diverse linguistic background levels (Johannesen, 2001) or with learning difficulties. Applying self-regulatory strategy is so effective that different researches defined successful students as those who use more self-regulatory strategies in different aspects of cognitive, metacognitive, motivational and task management (Pintrich, Smith, Garcia & McKeachie, 1993; Zimmerman & Martinez-Pons, 1986).

ADHD as a predominant neurodevelopmental deficit, is considered to be one of the most commonly diagnosed childhood disorders (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007) that typically continues into adolescence and adulthood (Barkley, Fischer, Edelbrock, & Smallish, 1990; Biederman, Faraone, Milberger, Curtis, Chen, & Marris, (1996). According to Douglas (2008), poor function in self-regulation is responsible for weakened performance of ADHD students on cognitive, information-processing and neuropsychological tasks.

This study emphasized writing as one of the most challenging skills that determines students' success at college and university. Writing has been a demanding task to not only the students with ADHD but also those without any learning disabilities. The purpose of this study was demonstrating the results of applying self-regulatory strategies on the essay writing

of ADHD and NON-ADHD students. SRSD could be effective to improve and enhance learners' writing through planning, editing, and monitoring in the process of essay writing (Englert, 2009; Graham & Perin, 2007).

## **Review of the Literature**

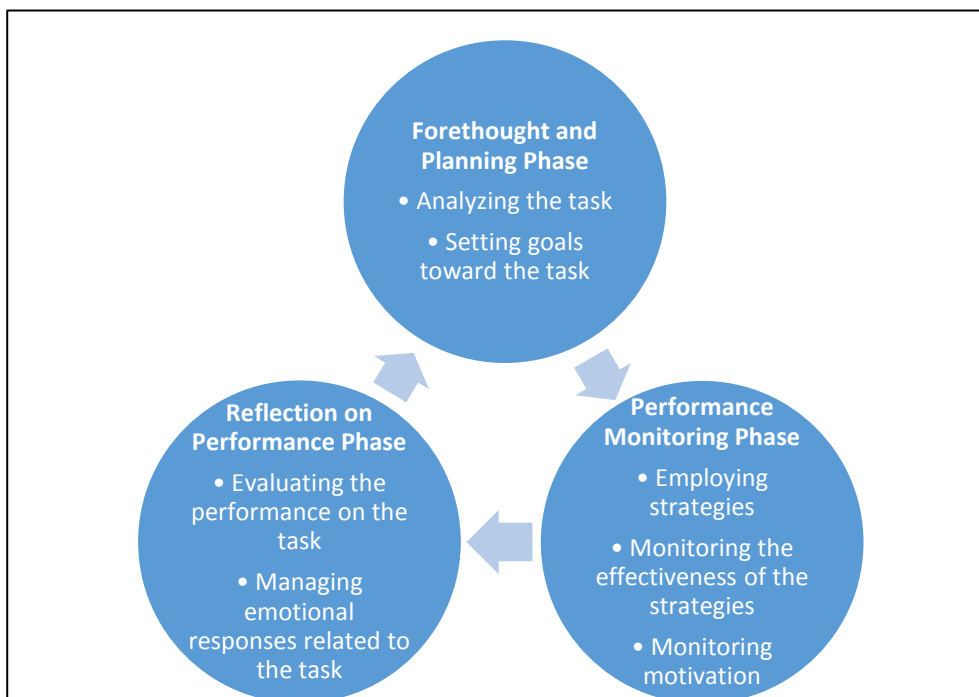
### **Self-Regulation**

Self-regulation is a kind of ability in individuals to enable them monitor their learning and make changes to the strategies they employ; it leads to have control over their overall learning as well as their attitudinal and motivational states (Ellis, 2004). Self-regulation is considered as a system that consists of complex and superordinate set of functions sharing the same concept in different fields. In the field of psychology, it includes research on cognition, problem solving, decision-making, metacognition, conceptual change, motivation, and volition (Carver & Scheier, 1990). Focusing on the major aspects of self-regulation in education, Pintrich (2000) defined self-regulation as students' planning, monitoring and regulating their metacognitive strategies.

In order to elaborate the concept of self-regulation, it is essential to discover the characteristics of self-regulated learners. Zimmerman (2002) defined more achieving students as self-regulated learners who have an active role throughout their learning in the cognitive, motivational and behavioral aspects.

Zimmerman (2000) based on the social-cognitive perspective of Bandura (1986) established a model of self-regulation, which refers to the self-generated thoughts, feelings, and actions. He illustrated that every individual is constantly in an ongoing process of planning and adapting to achieve his/her goal. Students need to be engaged in an active role of self-regulated learning in cyclical process of three phases "preaction phase", "action phase" and "postaction phase" (Schunk & Zimmerman, 2007). In the process of self-regulated learning, students are active managers who organize their thoughts, behaviors, and emotions in a feedback cycle of their own learning (Zimmerman, 2008).

As it has been shown in Zimmerman' popular cyclical model (2008), there are three phases: a) forethought and planning, b) performance monitoring phase, and c) reflections on performance (See Figure 1). Each phase will be defined according to Zimmerman (2008) in the following lines.



**Figure 1.** Self-Regulated Learning (Zimmerman, 2008, p. 171).

In the forethought phase, students are involved in planning, goal setting, and prior knowledge activation before the actual performance phase. When students decide to write an essay, first they have to evaluate the required data and time on the writing task. They think about what they had learned previously regarding the topic and related knowledge. Then, they would plan how and when to accomplish their task based on their motivation and self-efficacy. In the monitoring phase learners need to be aware of their performance and keep track of their improvement during the task. In this stage of self-regulation, students apply strategies and monitor the effectiveness of their strategies constantly towards achieving their goal. In the last phase, students evaluate and manage not only their performance but also their emotion on the task. After observing the results of the accomplished task, they would be able to evaluate their ability on the task. In the evaluating phase, students have to recognize whether they are interested in that specific task or not. It can also reveal their strengths and weak points in that specific field based on their interest and attitude. Being aware of their own feeling and attitude play an important role in the self-regulation process. These strategies might help learners make plans or decisions about their learning in later situations. By applying self-regulation, they would be engaged in an ongoing cyclical process of learning to achieve their goal.

**Self-Regulation and Motivation.** In the process of self-regulation, motivation has a crucial effect on students' academic improvement and result (Pintrich & De Groot, 1990; Pintrich, 2004; Zimmerman, 2008). In order to have self-regulated students, it is necessary to consider motivational aspects of students. Self-regulated learners have both academic learning skills and self-control over their learning process; in other words, they are more motivated since they have the skill and the will to learn (Murphy & Alexander, 2000). Students can direct and regulate their cognition by using motivational strategies in addition to cognitive and metacognitive strategies (Pintrich, Marx, & Boyle, 1993).

Pintrich (1999) believes that knowledge of cognitive and metacognitive strategies may not be sufficient to promote students' learning. In fact, students should also have reasons to use self-regulated strategies and just when they are motivated enough, they could use these strategies and regulate their cognition and effort. Pintrich & De Groot (1990) examined the relationships between motivational orientation, self-regulated learning, and classroom academic performance. In their study, they measured students' self-efficacy, self-regulation, and the use of learning strategies. The results of their study revealed that those students who were using more self-regulated strategies, could achieve higher grades than those with less self-regulated strategies. They also reported that motivational aspects of the students were highly connected to students' cognitive perception and academic performance. Accordingly, the students' self-efficacy was positively associated with the students' cognitive engagement and performance.

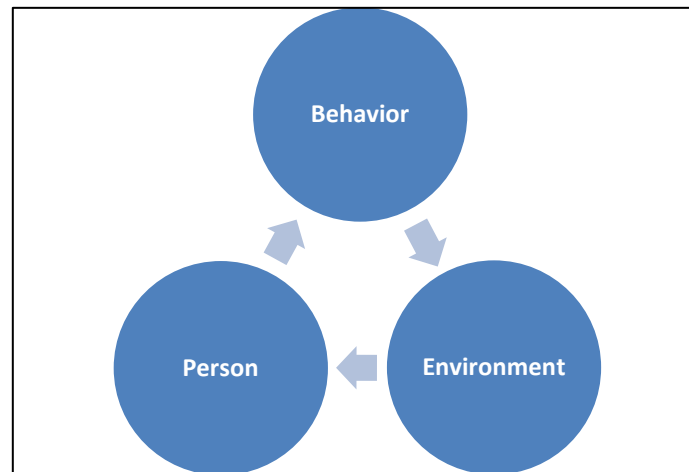
Paris & Paris (2001) viewed self-regulated learning as a set of skills that can be taught and applied explicitly in the classroom. Therefore, teachers can help learners become strategic, motivated and independent by providing them with appropriate information and opportunities. According to Paris & Paris (2001), in order to have effective learning, different aspects of self-regulation such as metacognitive, motivation, and emotional factors have to be added to the cognitive dimension of learning. They described that students need a broader type of strategies rather than examining particular strategies such as summarizing and editing an essay. They emphasized the usage of strategies that depends on awareness of procedural, declarative and conditional knowledge along with motivational attributions and feeling of efficacy.

### **Self-Efficacy**

One of the fundamental factors in self-regulation is self-efficacy (Major, Martinussen, & Wiener, 2013, Usher & Pajares, 2008, Bandura, 2000). It has been investigated that students

with less positive self-efficacy and insufficient academic skill revealed limited academic success (Major et al., 2013).

Bandura's Social Cognitive Theory (1986, 2001) is a famous conceptual theory that defines human functioning as a series of reciprocal interactions between "personal influences", "environmental features" and "behaviors" (See Figure 2). As a result, each factor is not considered to be functioning separately but the whole process is operating as a system.



**Figure 2.** Bandura's Model of Reciprocal Interaction

Bandura (2001) explained that reciprocal interactions show how people interrelate their behaviors and environments with their thoughts and beliefs. He considered "self-efficacy" and "self-regulation" as two important factors that people use to employ control over the important aspects of their life. Self-efficacy refers to "Peoples' judgements of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391).

A key concept in Schunk & Zimmerman's preaction phase (2007) is self-efficacy. Students build their self-efficacy based on the result of their achievement and following it, self-efficacy would have great influence on their achievement as well. Achieving self-efficacy is due to students' perception of their ability (Dweck, 1999). If learners believe that they are capable of achieving a task, it leads to a kind of self-efficacy belief. Therefore, the kind of feedback teachers give students has a very influential effect on the students' belief and success. Assertive sentences from teachers would help students believe in their own ability and potential capability. Receiving sentences such as "Yes, you could do it, very good" has a very constructive influence on the students' self-efficacy beliefs.

## Attention Deficit Hyperactivity Disorder

Attention-Deficit Hyperactivity Disorder is a predominant neuro-developmental childhood disorder (Barkley et al., 1990; Biederman et al., 1996) which may remain until adulthood and may cause impairment in multiple domains including academic achievement, individual's relationships, and mental health (Babinski, Pelham, Molina, Gnagy, Waschbusch, Yu, Karch, 2011; Lee, Lahey, Owens, & Hinshaw, 2008). Investigating the educational achievement of ADHD children in follow-up studies into adulthood, verified that ADHD students are more likely to exhibit academic underachievement, lower grades or even dropping out of school (Bussing, Mason, Bell, Porter, & Garvan, 2010).

Russell A. Barkley, a clinical researcher who has worked over the last 40 years studying ADHD deficits and their relations to self-regulation problems and executive functioning, defined the predominant features of ADHD as: a) impaired response inhibition, b) impulse control, and c) the capacity to delay fulfilment (Barkley, 2012). He defined ADHD individuals as those who find it difficult to stop and think before acting, and have problems in all aspects of waiting for their turn, resisting distractions while working on a task, concentrating on a subject, and working for a longer term (Barkley, 2006). Moreover, he described that ADHD people are known to be extremely fidgety, restless, and "on the go". They cannot remain in one position for a long time and need to shift their posture or position while performing relatively boring tasks (Barkley et al., 1990). This problem is more obvious in younger children with ADHD disorder and this tendency would be declined with age, but even ADHD teenagers are considered to be more restless and fidgety than their peers. He added that if this disorder continues until adulthood, this restlessness may become more subjective than seemingly observable, and they may even follow unnecessary task-irrelevant activities or activities that are poorly regulated to their particular situation.

In education, the main concern of ADHD people is difficulty in keeping constant attention and then persistence of effort to tasks (Barkley, 2006). When ADHD individuals are given boring and repetitive activities with no intrinsic motivation, they find it very difficult to draw all their attention to the task (Biederman et al., 1996). Thus, they get easily distracted while they are working on an activity; afterwards they experience inability returning to the task they were working on. Therefore, motivation, self-efficacy and external support have great influence on the learning achievement of ADHD students.

Other than the mentioned common areas of difficulty associated with ADHD, Barkley & Murphy (2006) explained some other psychological subtypes related to ADHD disorder.



1. Remembering to do things is not easy for them. Their minds have a limited capacity to hold the information for the future retrieving. For this reason, they are known as forgetful and disorganized in their thinking and pursuing long-term goals.

2. In the process of learning, internal language or private speech has an essential effect to the normal development of contemplation, reflection, and self-regulation of individuals.

3. They also face challenges with regulation of their emotions and motivation. Not only children but also adults with ADHD often experience problems regulating their emotions and emotional reactions. They seem to be unable to internalize, moderate and analyze their feelings properly.

4. Other deficiencies are problem-solving ability, creativity, and perseverance in pursuing long-term goals. If they encountered problems in the process of achieving their goals, they would not be able to provide different possibilities and solutions.

**ADHD and Self-Regulation.** ADHD has been defined as persistent inappropriate level of inattention, hyperactivity, and impulsivity, which is a kind of dysregulation attributed to deficits in self-monitoring or adaptive control (Shiels & Hawk, 2010). According to Douglas (2008), impaired performance of individuals with ADHD on cognitive, information-processing and neuropsychological tasks is due to poor self-regulation. Barkley's theoretical model of ADHD (2012) emphasized that individuals with ADHD show a significant impairment in self-regulation due to deficits in core executive functions (EFs). The core aspects of Barkley's EFs (2012) include self-regulation of motivation, inhibitory control, working memory, forethought, planning, and problem solving.

Deficient Regulation Hypothesis (Douglas, 1999), elaborated various aspects of ADHD problems which could cause a significant challenge for them. Deficient Regulation Hypothesis emphasized the integration of cognition and motivation domains. The shift of focus from a specific cognitive deficit to several processes in Deficient Regulation Hypothesis (Douglas, 1999) is so effective that may influence all constructs of learning such as sustained attention, response inhibition, or working memory. It suggests that applying self-regulation and executive functioning could lead to efficient attention and inhibition in learning process. The mentioned adaptive process moderates cognitive impediments associated with ADHD, including working memory, self-monitoring, and planning.

## **Writing Process**

Achieving a significant level of writing is one of the main goals of pedagogical instruction. Applying SRSD could improve the regular writing instruction at academic level. Writing is a



demanding cognitive and social process that depends on writers' knowledge, skills and strategies along with self-regulation and motivation (Hayes, 1996). Flower and Hayes (1981) proposed a comprehensive model of writing, including three fundamental components: 1) task environment 2) cognitive processes 3) the students' long-term memory. In Flower and Hayes' writing process (1981), the students are asked to "think aloud" while writing. Their tasks consist of the topic, audience and motivational clues. Their cognitive aspect involves mental engagement in the form of self-regulation of goal setting, generating and organizing ideas, along with planning, transcribing and reviewing. Their last component, long-term memory, is about the writer's knowledge of the topic, writing process, intended audience and general goals and plans about the writing tasks.

### **Statement of the Problem**

Writing as an essential part of learning in the academic improvement has been a demanding task for students and educators. It is unfortunate to note that the educational system of Iran has majority of students who lack the proper academic writing ability. Consequently, instructing students to plan effective writing strategies and applying the knowledge of effective instruction are essential for educators and learners. Self-regulatory strategies could facilitate writing challenges of academic education in order to make the students more competent in this regard. ADHD students may achieve more benefit from self-regulatory strategies than NON-ADHD learners, since they face much more difficulties in writing and learning. ADHD students mostly face challenges in different aspects of self-regulation so they receive poorer grades compared to NON-ADHD students.

In response to this problem, our study examined the effects of SRSD on the essay writing of EFL undergraduate students. SRSD instruction may facilitate difficulties of ADHD and NON-ADHD students' essay writing in L2 context.

### **Significance of the Study**

An essential part of writing development is knowledge of the process of writing besides different effective factors in this process. SRSD instruction (Graham & Harris, 2003; Harris & Graham, 1996) has been used to teach university students essay writing and the required self-regulation procedures for effective writing. SRSD intervention addressed not only the cognitive aspects of learners but also the metacognitive and motivational features of them.

Since some struggling students face difficulties in essay writing, the present study focused on ADHD disorder and the strategies to solve this problem. ADHD and NON-ADHD learners could benefit from the self-regulation procedure of SRSD instruction such as goal-setting, self-monitoring, self-instruction, and self-reinforcement.

Unlike previous studies which mainly focused on adolescents or young ADHD learners, this study investigated the effects of SRSD on EFL undergraduate students and particularly in L2 context.

## Research Questions

The following research questions were proposed in this study.

RQ1: Does SRSD instruction have any significant effect on the essay writing of ADHD learners?

RQ2: Does SRSD instruction have any significant effect on the essay writing of NON-ADHD learners?

RQ3: Is there any significant difference between the essay writing of Conventional Group and SRSD Group after receiving SRSD instruction?

RQ4: Is there any significant difference between the essay writing of ADHD students in the Conventional Group and ADHD students in the SRSD Group after receiving the SRSD instruction?

## Method

### Design

The study is quantitative with a quasi-experimental design. The researchers collected the data based on a purposive sampling.

### Participants

Participants of this study were 126 undergraduate students majoring in English translation, literature and teaching at Tehran Azad University - Central Branch. The participants who ranged in age from 18 to 40, in mixed male and female groups, enrolled in four essay-writing classes with the same syllabus and materials. Two classes with 62 students as the experimental group received the SRSD intervention and 64 students in the other two classes as the control group had the Conventional instruction. One teacher instructed two classes as the experimental group and another teacher taught the other two classes as the control group.

In order to assure the consistency of teaching in all classes, the researchers and the instructors had two briefing sessions at the beginning of the course and by preparing and following equal lesson plans along with the same course book and same genre topics, they tried to reduce the intervening variables. The students were screened for this study based on their writing scores on their pre-test. After obtaining the scores of pre-test, the students whose scores were within two Standard Deviations (SDs) above and below the mean, were selected (N=126) as the main participants of this study and the rest were excluded.

## **Instruments**

**Adult ADHD Self-Report Scale (ASRS) Symptom Checklist.** Adult ADHD Self-Report Scale (ASRS), World Health Organization 2003, is a Symptom Checklist instrument that consists of eighteen DSM-IV-TR criteria. Part A of the Symptom Checklist consists of six questions that were found to be the most predictive of symptoms consistent with ADHD. These six questions are the basis for the ASRS v1.1 Screener. Part B of the Symptom Checklist contains the remaining twelve questions less predictive of ADHD symptoms. A psychologist piloted ASRS in a group of 10 ADHD adults in a psychological clinic before administering it in this study. The results revealed that ASRS is a valid checklist to be administered in this study.

**Self-Regulated Strategy Development (SRSD) Instruction.** The five-stage-SRSD instruction (Graham & Harris, 2003) was employed as the intervention of this study in the experimental group. It consists of different phases of “background knowledge”, “discuss it”, “model it”, “memorize it”, and “support it”.

**Mnemonic POW-TREE Strategies.** The mnemonic POW-TREE model was used along with the SRSD writing instruction to teach essay-writing procedures to the participants of the experimental group.

**Essay Writing Scale (READ, WRITE, THINK - International Reading Association, 2013).** Essay Rubric consists of five categories that are essential traits of a good essay writing. It has five subscales of “Focus and Details”, “Organization”, “Voice”, “Word Choice” and “Sentence Structure, Grammar, Mechanics, & Spelling”. The students’ pre-tests and post-tests were analyzed through this essay writing scale. It is based on the Writing Process Model of Flower and Hayes (1981) which included the related components of essay writing.

## **Data Collection**

The participants of this study, 126 students, enrolled in an essay-writing course at university. Based on the students' writing score on their pre-test, they were screened as the main participants. The participants enrolled in four writing classes with the same syllabus and course book. Two classes with 62 students as the experimental group, benefited from the SRSD intervention and 64 students in the other two classes as the control group had the Conventional instruction.

The students answered the "Adult ADHD Self-Report Scale (ASRS)" checklist in order to be diagnosed with ADHD. The intervention of this study was SRSD writing instruction with the mnemonic POW-TREE strategies in the experimental group. The teacher started the course by briefing the students regarding the concepts of self-regulation. After briefing the students with the required concepts she started teaching essay writing by following the SRSD instruction in five stages of develop background knowledge, discuss it, model it, memorize it, and support it (Harris & Graham, 1996).

In the first stage, "Develop Background Knowledge", the students had to acquire the knowledge, vocabularies and the concepts required in their writing. The teacher presented the idea of self-regulated learner by talking about writing and asking the students about what they know regarding good writing. The teacher defined and explained the abbreviated letters of POW-TREE and its significance to the learners. POW-TREE mnemonic strategy has been used along with the SRSD instruction in order to help students remember and practice the elements of the essay-writing process (Harris, Graham, Mason, & Friedlander, 2008). The Teacher and the students discussed each part of POW-TREE strategies and brainstormed examples of them. POW stands for the steps: Pick my idea, Organize my notes, Write and say more, and TREE stands for Topic Sentence, Reasons, Explanations, and Ending.

In the second stage, "discuss it": The students were instructed to use POW-TREE strategies in their essay writing. The teacher practiced different phases of POW-TREE to help them memorize and apply the stages in their writing. Each component was explained with the relevant example.

Then in the "Model it" stage, the teacher played as a role model to the students by "thinking out loud" to teach them how to Plan, Organize, and Write an essay using the required strategies. The teacher mentioned a variety of self-statements in the form of thinking out loud to show the students the importance of their feeling and attitude as well as their cognitive skills.

In the next phase, “Memorize it”; students practiced POW-TREE pneumonic activities and writing strategies in order to learn and memorize the steps thoroughly. By memorizing different parts of POW-TREE, the students were able to apply SRSD strategies in their writing independently.

The “Support It” phase had its importance regarding SRSD instruction and self-regulation. This scaffolding phase fulfilled the needs of the students who had some questions or problems in their writing. This phase started with collaborative writing. It first began with setting their goals to write a good essay then the teacher and students planed and organized the writing by following POW-TREE procedures.

In the last phase, independent performance task, the students started to write an essay without the support of the teacher. In this stage, the teacher reminded the students that they would be able to achieve their goals by consistent use of SRSD strategies over time. The students were encouraged to consider the concept and importance of SRSD strategies as they were writing the essays independently.

The topics of students’ pre-test and post-test were both descriptive and the papers were evaluated and scored based on the “Essay Writing Scale Rubric”.

In the control group, the teacher instructed the students with the same topics and book as in the experimental group but they had Conventional method of teaching by doing the exercises of course book and writing a paper for each session.

## Results and Discussion

In order to evaluate the effects of SRSD instruction on the essay writing of ADHD students in the experimental group, a repeated measure of ANOVA was run to determine the significant difference between their pre-test and post-test scores.

The result revealed that there was a significant difference between their pre-test and post-test scores as determined by one way ANOVA ( $F(1, 13) = 112.61, p = .000$ , (See Table 1. & 2.). Therefore, it can be concluded that SRSD instruction had a significant effect on the essay writing of ADHD students in the experimental group.

**Table 1.** ADHD Students’ Pre-test/post-test scores - SRSD Group

Group		Mean	Std. Deviation	N
Experimental ADHD	Pre-test	11.86	1.345	7
	Post-test	15.43	.976	7

**Table 2.** Multivariate Tests of ADHD Students' pre-test/post-test scores - SRSD Group

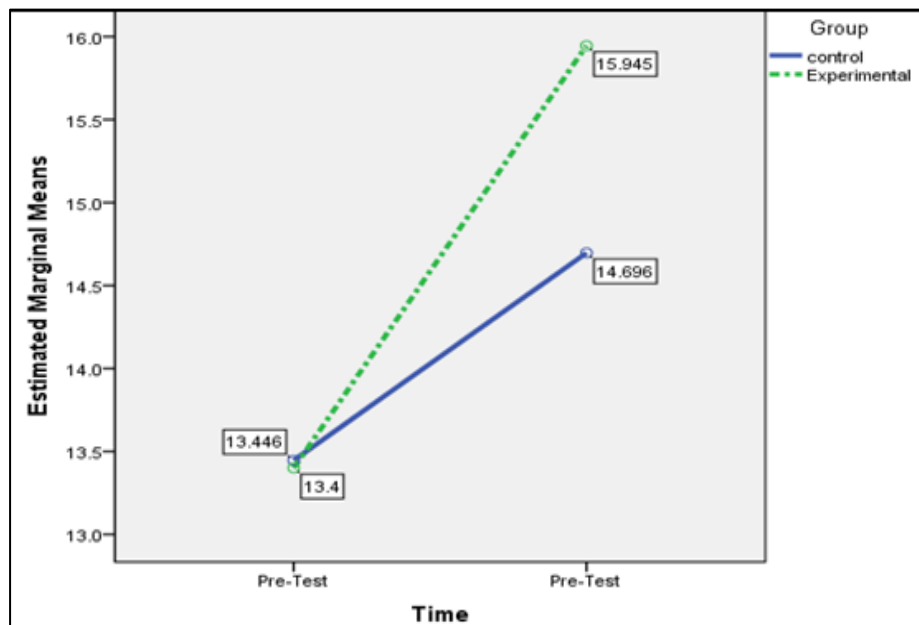
	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Time	Wilks' Lambda	.897	112.616 <sup>b</sup>	1.000	13.000	.000	.897

In the experimental group, 55 NON-ADHD students received SRSD intervention. In order to find out whether the difference between their pre-test and post-test is significant, a repeated measure was run. The result of repeated measure ANOVA was ( $F(1,109) = 362.666$ ,  $p = .000$ , (See Table 3. & 4.). It can be concluded that there was a significant difference between the pre-test and post-test of NON-ADHD students in SRSD group. In other words, SRSD intervention had a significant effect on the essay writing of NON-ADHD students in the experimental group (See Figure 3.).

**Table 3.** NON-ADHD Students' pre-test/post-test scores - SRSD Group

Group		Mean	Std. Deviation	N
Experimental	Pre-test	13.40	3.04	55
NON-ADHD	Post-test	15.95	2.46	55

Estimated Marginal Means of NON-ADHD

**Figure 3.** Comparing the pre-test/post-test of NON-ADHD Students in Control and Experimental Group

**Table 4.** Multivariate Tests of NON-ADHD Students' pre-test/post-test scores - SRSD Group

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Time Wilks' Lambda	.231	362.666 <sup>b</sup>	1.000	109.000	.000	.769

The researchers, by means of running an ANCOVA, tried to perceive any significant difference between the essay writing of Conventional Group and SRSD Group after receiving SRSD instruction. The mean score of post-test in SRSD group was 15.89 after receiving the intervention; on the other hand, the mean score of post-test in Conventional group was 14.38. Accordingly, the statistical results of ANCOVA revealed Sig = .000, Sig < .05 (See Table 5. & 6.). It can be concluded that there is a significant difference between the students in the control group and the students in the experimental group with respect to the treatment they received in terms of their essay writing (See Table 6.). The comparison between two experimental and control group was illustrated in Figures 3. As it could be seen, although the students' essay writing has improved in the control group, the students' essay writing in the experimental group outperformed the other group.

**Table 5.** Control and Experimental post-test scores

Post-Test	Group	N	Mean	Std. Deviation
Post-test Essay-Writing	Control	64	14.38	2.57
	Experimental	62	15.89	2.38

**Table 6.** Test of Between Subjects Effects, ADHD Students' post-test scores of Control and Experimental Group

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Group	70.260	1	70.260	84.802	.000	.408

Then the essay writing of ADHD students in the experimental group and the essay writing of ADHD students in the control group were compared to perceive the effectiveness of SRSD instruction compared to Conventional instruction on ADHD learners. The result of ANCOVA analysis revealed that the significance is Sig = .000, Sig < .05 (See Table 7. & 8.). Accordingly, there is a significant difference between the ADHD students in the experimental group and the ADHD students in the control group with respect to their essay writing. It is worth mentioning that although ADHD students in the control group improved their essay writing, compared to the ADHD students in the experimental group, their improvement was



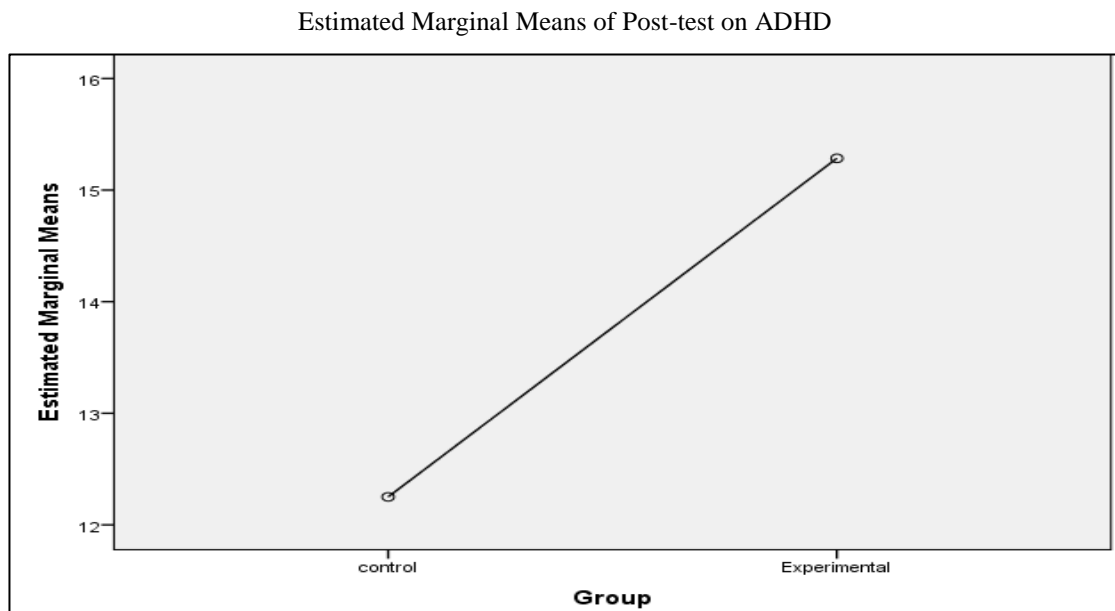
not significant. To clarify the result, the ADHD students who benefited from SRSD interaction outperformed the ADHD students in the Conventional group (See Figure 4.)

**Table 7.** ADHD Students’ post-test scores - Control and Experimental Groups

Post-Test	Group	N	Mean	Std. Deviation
Post-test Essay-Writing ADHD	Control	8	12.13	1.95
	Experimental	7	15.43	.97

**Table 8.** Test of Between Subjects Effects, ADHD Students’ post-test scores of Control and Experimental Group

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Group	34.026	1	34.026	87.303	.000	.879



**Figure 4.** Covariates Appearing in the Model are Evaluated at the Following Values:  
Pre-test = 11.67

The findings indicated that SRSD instruction improved the essay writing of students, both ADHD and NON-ADHD, in the experimental group. In the control group, the students benefited from the Conventional method and enhanced their writing, but SRSD instruction was much more effective than the Conventional method. It can be concluded that SRSD instruction was statistically more effective than the Conventional instruction on essay writing of EFL undergraduate students. The improvement of both groups could be seen in Figures 3 and 4.

In order to analyze the five subcategories of “Essay Writing Scale” (READ, WRITE, THINK - International Reading association, 2013), two tests, an ANOVA, and a Friedman

Test, were run for both control and experimental group. The results were presented in three different forms of between groups, within groups and the total results in Table 9.

**Table 9.** The Results of ANOVA Test, the Analysis of Subscales of Essay Writing

		Sum of Squares	df	Mean Square	F	Sig.
Focus Improvement	Between Groups	8.926	1	8.926	104.061	.000
	Within Groups	10.636	124	.086		
	Total	19.562	125			
Organization Improvement	Between Groups	9.462	1	9.462	134.256	.000
	Within Groups	8.739	124	.070		
	Total	18.201	125			
Voice Improvement	Between Groups	1.745	1	1.745	19.209	.000
	Within Groups	11.264	124	.091		
	Total	13.008	125			
Word Improvement	Between Groups	.079	1	.079	1.095	.297
	Within Groups	8.924	124	.072		
	Total	9.002	125			
Sentence Improvement	Between Groups	.054	1	.054	.602	.439
	Within Groups	11.218	124	.090		
	Total	11.272	125			

The Friedman test result revealed that in the control group, the most improved subcategory was “word improvement” and the least improved part was “organization improvement” whereas in the experimental group, due to the effect of SRSD instruction, “organization improvement” had the highest and “voice improvement” had the lowest improvement. It could be concluded that considering the overall essay writing improvement of the experimental students, “organization improvement” was specifically greater than the other subcategories after receiving SRSD intervention (See Table 10.).

**Table 10.** The Results of Friedman Analysis of Subscales in Control and Experimental Group

Group	Mean Rank	
Control	Group	5.91
	Focus Improvement	2.47
	Organization Improvement	2.34
	Voice Improvement	2.56
	Word Improvement	3.90
	Sentence Improvement	3.83
Experimental	Group	6.00
	Focus Improvement	3.78
	Organization Improvement	3.81
	Voice Improvement	2.38
	Word Improvement	2.56
	Sentence Improvement	2.47

Figure 5. reveals the comparison between the subcategories of “Essay Writing Scale” in more apparent structure in both control group, experimental group and based on their overall improvement of both groups.

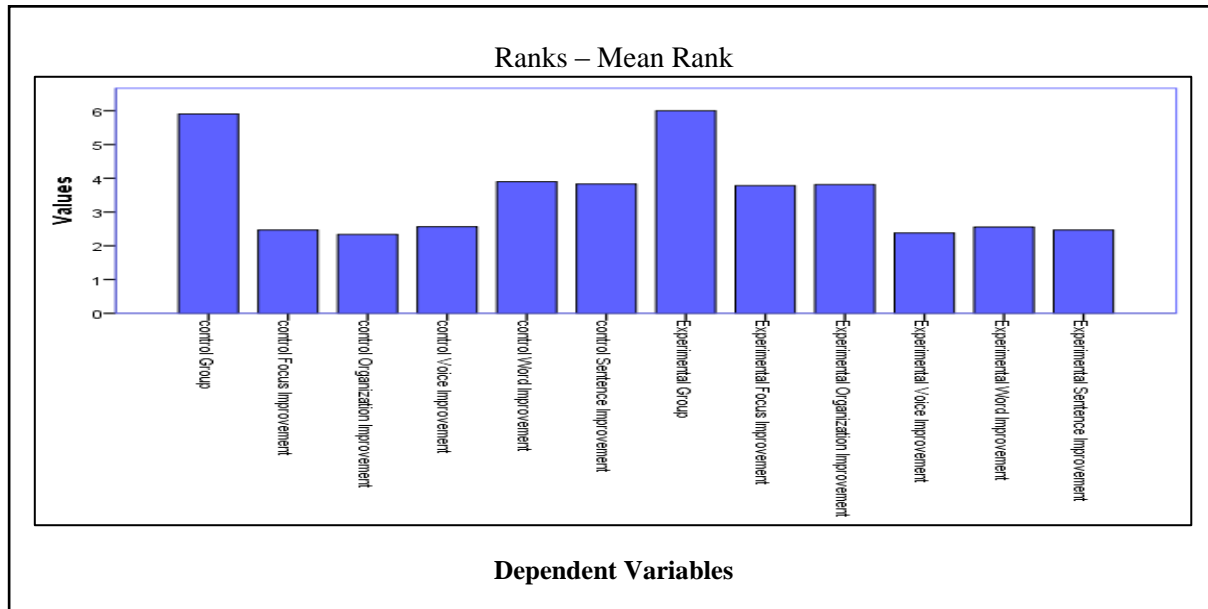


Figure 5. The Compared Categories of Essay Writing in Experimental and Control Group

## Conclusion

The present study investigated the effects of SRSD instruction on the essay writing of EFL undergraduate students considering ADHD deficiency. According to the results of the study, SRSD had a significant effect on the essay writing of both ADHD and NON-ADHD students. Most importantly, it significantly improved the essay writing of ADHD students in the experimental group.

The current result supported the previous studies in approving the importance of self-regulatory strategies on the improvement of students' writing skills. In the same way, in the present study SRSD instruction had a beneficial effect on the writing of achieving students as well as struggling learners, such as ADHD students.

The result of this study is in line with the other studies such as Graham (2006), Graham & Harris (2003) and Graham & Perin (2007) in indicating the great influence of SRSD on the quality of students' writing. This result can replicate previous findings that the students using SRSD, and POW-TREE strategies could remember and apply the process of writing to achieve academic writing improvement. Moreover, the findings of some studies such as Namie, Enayati, and Ashouri, (2012), Roohani and Baghbadorani, (2012) conducted in Iran are in line with the results of the present research.

The findings of current study shed some light to assist students with ADHD. It suggests that academic writing difficulties could be due to the failure in self-regulation of learners. Instructors at universities could assist not only achieving but also struggling students improve their essay writing with implementing the self-regulatory instruction. It can be concluded that the role of teacher in SRSD instruction is so effective that students can reach their goal by having teacher's appropriate support and having her as a role model. In order to achieve their goals, teachers need to have the strong support of policymakers and curriculum developers regarding the implication of self-regulation in education.

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