# Using Self-regulation to Enhance EFL Learners' Reading Comprehension

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*Abstract*—This study was an attempt to investigate the effect of self-regulation on EFL learners' reading comprehension. To fulfill the purpose of this study, 149 Iranian EFL language learners studying at Islamic Azad Universities of Qazvin and Tehran (North, and Science and Research branches) were selected from a total number of 200 based on their performance on TOEFL PBT test and randomly put into two experimental and control groups. The experimental group received direct teaching along with task-based instruction on self-regulation in reading in ten sessions. The tasks/activities were designed based on self-regulation strategies proposed by Zimmerman (1989). The results showed the rejection of the null hypothesis, thus concluding that self-regulation has a significant effect on reading comprehension of Iranian EFL learners. This investigation has some implications for language programs for ESP/EAP purposes in Iran.

*Index Terms*—reading comprehension, self-regulated learning, self-regulation strategies, Iranian EFL learners

## I. INTRODUCTION

Over the past thirty years, the concept of learning strategy has been influential in both language learning and teaching. Generally it is believed that learners with strategic knowledge of language learning become more efficient and flexible, thus they can acquire a language more easily. However learning strategies are not theoretically and operationally well-defined. Theoretically, various terminology and classifications have been used to refer to learning strategies (such as O'mally & Chamot, 1990). Operationally, the psychometric properties of the assessment instruments measuring learning strategies are in question (Dornyei, 2005; Tseng, Dornyei & Schmitt, 2006; Ellis, 1997; Gu, 2005). To overcome some weaknesses, scholars turned to a related and new concept, self-regulation. However, according to Dornyei (2005), this does not mean that scholars have developed second thoughts about the benefits of learning strategies. The effectiveness of one's own learning is seen as more important than ever before. The new concept of self-regulation "offered a broader perspective than the previous focus on learning strategies" (p. 190). That is, there is a shift from "the product (strategies) to the process (self-regulation)" (p.191). In addition self-regulation is a more dynamic concept than learning strategy.

## II. LITERATURE REVIEW

### Self-regulated Learning

In both educational psychology and language education, extensive research effort has been made to teach students how to learn. Since the 1970s, due to the findings in cognitive science, the research concern in L2 learning and teaching has shifted from methods of teaching to individual differences. Thus, investigating language learning strategies has become a featured research area in L2 studies. Comparing the research on language learning strategies in second language acquisition and self-regulated learning in educational psychology, scholars have suggested that further research in language study can be enriched through self-regulated learning (Dornyei, 2005; Ping, 2012).

According to Bandura's (1989) social cognitive theory (SCT), self-regulation is not only determined by personal processes, but also influenced by environmental and behavioral factors in mutual ways. Based on the social cognitive learning theory, Zimmerman (1989) defines self-regulation as the degree to which students are "metacognitively, motivationally, and behaviorally active participants in their own learning process" (p.1). Zimmerman adds that this definition implies reciprocal relationship among three processes of personal, behavioral, and environmental (see Figure 1). Therefore, developing strategies to control person, behavior, and environment help students to be self-regulated in learning.
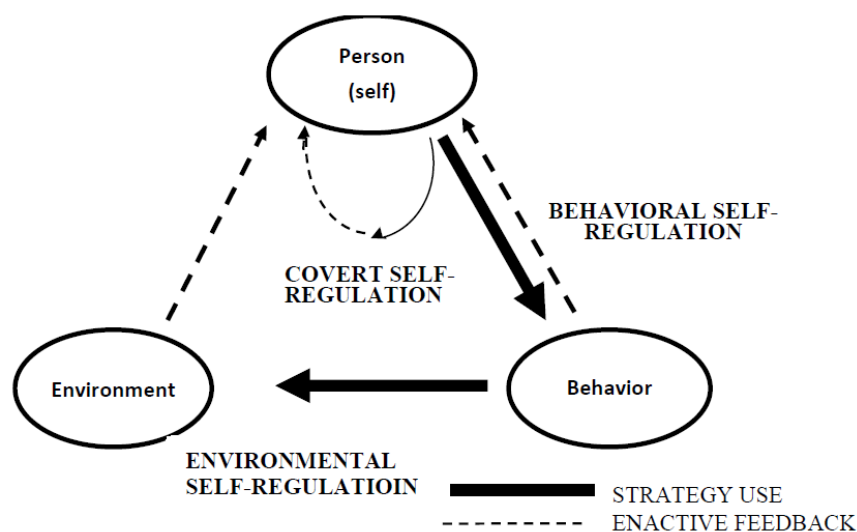
Figure 1. A triadic analysis of self-regulated functioning (Zimmerman, 1989, p. 3)

*Personal influences:* There are four personal influences: students' knowledge, metacognitive processes, goals, and affect. As far as students' knowledge is concerned, a distinction is made between three types of knowledge: declarative, procedural, and conditional. Declarative knowledge refers to knowledge about specific learning strategies. Procedural knowledge is knowledge of how to use these strategies, and conditional knowledge is the knowledge of when and why strategies are effective.

To Zimmerman, metacognitive decision-making processes involve two levels of planning and controlling. At a general level of self-regulation, planning involves decisional processes for selecting or changing self-regulation strategies. At a specific level, control processes guide monitoring of strategic and nonstrategic responses. According to this analysis, "students' effectiveness in planning and controlling their use of personal, behavioral and environmental strategies to learn is one of the most visible signs of their degree of self-regulation" (p. 6)

Taking the concept of goals into account, Zimmerman states that goals should be set on the basis of their proximity in time, referred to as proximal goal setting. Paris and Winogard (2011) assert that when goals are set by others, behavior is obedient rather than self-directed. They point out the differences between proximal vs. distal goals, attainable vs. unattainable goals, and performance vs. mastery goals. According to Lapan (2010) and Torrano and Torres (2004), numerous studies have shown that learners who adopt mastery goals were more successful than those learners with performance goals. Mastery goals aim at expanding one's understanding of a subject or improving one's skills. On the other hand, performance goals target at avoiding inferiority or avoiding looking bad in relation to peers.

Affective states can also influence self-regulated learning. Zimmerman claims that evidence shows anxiety can, for example, impede different metacognitive processes, particularly control processes, and this, in turn, can inhibit setting long-term goals. He further adds that to social cognitive theorists, self-efficacy is a key variable affecting self-regulating learning because it is related to two key factors of learning strategy use and self-monitoring. Self-efficacy relates to a learner's beliefs about his or her capabilities to learn or to perform a task. Crozier (1997) and Torrano and Torres (2004) assert that the concept of self-efficacy, as proposed by Bandura (1989), refers to "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance. It is concerned not with the skills one has but with the judgments of what one can do with whatever skills one processes" (Crozier, 1997, p. 168). Lapan (2010) asserts "self-regulated learners are less likely to attribute poor performance to ability. They are more likely to understand poor performance as being due to insufficient effort or to the implementation of ineffective strategies" (p. 3).

*Behavioral influences:* According to Zimmerman (1989), there are three classes of student behavioral responses which are of relevance to the analysis of self-regulated learning: self-observation, self-judgment, and self-reaction. Each of these classes is influenced by personal processes, as well as environmental processes. In addition, the actions in these classes are observable, teachable, and interactive.

Self-observation refers to systematically monitoring one's own performance. "Observing oneself can provide information about how well one is progressing toward one's goals" (Zimmerman, p. 7). Zimmerman adds that two common behavioral methods of self-observation are reporting and recording of one's actions and reactions.

Self-judgment refers to "students' responses that involve systematically comparing their performance with a standard or goal" (p.7). Standards or goals may include social norms or temporal criteria, such as earlier performance or tests. Two common ways of self-judgment are checking and rating. Re-examining one's answers to a leaning problem and rating one's answer in relation to those of others or an answer sheet are two examples of checking and rating procedures respectively.

The third class of student self-regulated response is self-reaction to one's performance. Zimmerman mentions three interdependent classes of self-reaction strategies, which are derived from SCT. The first one is behavioral self-reaction strategies by which students try to optimize their learning responses. Using such strategies as self-praise or self-criticism is a case in point. The second class of reaction strategies are personal by which students seek to enhance their personal processes, such as goal setting or memorizing. Environmental self-reaction strategies are the third class by which students try to improve their learning environment. Structuring one's environment and asking for help are, according to Zimmerman, two common environmental self-reaction strategies.

*Environmental influences:* Social cognitive theorists have paid particular attention to the impact of social experience and environment on human functioning and learning. Zimmerman mentions five environmental influences which are assumed to be reciprocally interactive with personal and behavioral influences.

Modeling is one type of environmental influences, which are given particular emphasis in SCT, and has effect on self-regulation. Modeling of affective coping strategies is an example in this regard.

According to SCT, verbal persuasion is another important form of environmental influences; however, Zimmerman states that this type of social experience is less effective because it depends on learners' level of verbal comprehension, but if combined with other forms of environmental experiences, it can be a powerful medium for conveying a wide variety of skills. Verbal elaboration of a manipulation sequence is an example of verbal persuasion.

Direct assistance from others, like seeking help from teachers regarding an assignment, and using symbolic forms of information, such as pictures, diagrams, and formulas are two other sources of social support.

The final type of environmental influence is the structure of the learning context. According to SCT, learning is highly dependent on the context, such as task or setting. Changing the difficulty level of a task or changing a noisy academic setting to a quiet one are two cases in point.

Various models have been proposed for self-regulated learning. Two mostly referred are the Zimmerman (2002) model and the Pintrich (2004) model. However, in this study, the Zimmerman model has been used.

*The Zimmerman model:* Zimmerman describes self-regulated learning as an open and cyclical process on the part of the learner that occurs in three main phases: forethought, performance/volitional control, and self-reflection. Each phase is divided into subcategories. As seen in Figure 2 the forethought phase is the planning phase which precedes learning. This leads to planning which, in turn, combines with learners' motivational beliefs. The second phase is performance phase during which learners employ a variety of strategies which help them to maximize their academic performance. In addition, self-regulated learners observe different aspects of their performance. In the third phase, self-reflection, judgments are made about one's actions. As mentioned earlier, these phases are considered cyclical. The forethought phase prepares the student for learning and influences the performance phase. This in turn affects the processes of the self-reflection phase which interact with the next forethought phase. Each phase can facilitate or hinder the subsequent phase of the cycle (Zimmerman, 2002).
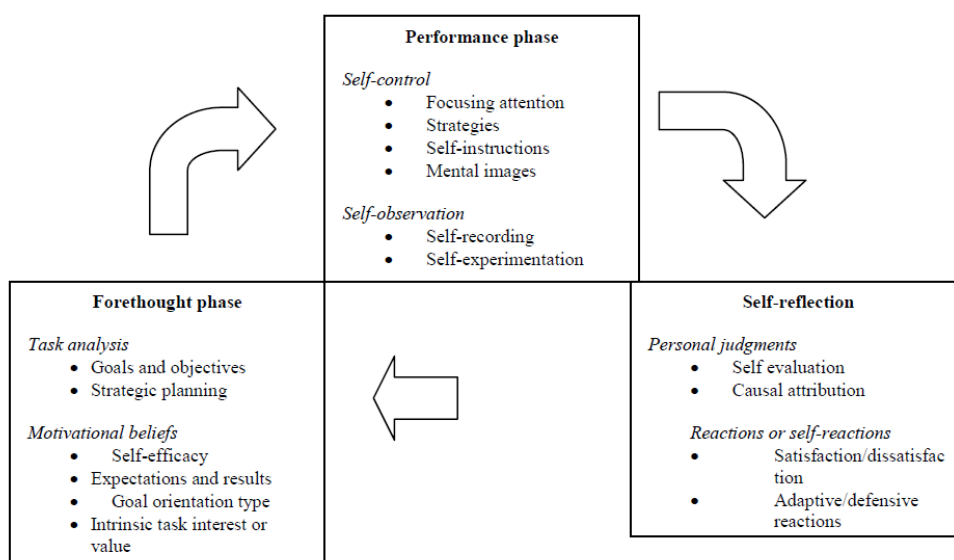


Figure 2. The Zimmerman model's of self-regulated learning cycle (Zimmerman, 2002, p. 67)

Zimmerman (2002) explains that self-regulated learning is not only a simple personal trait that learners either posses or lack, but it consists of the selective use of specific processes personally adapted to each learning task. He adds that self-regulated component skills are as follows:

(a) setting specific proximal *goals* for oneself, (b) adopting powerful *strategies* for attaining the goals, (c) *monitoring* one's performance selectively for signs of progress, (d) *restructuring* one's physical and social context to make it

compatible with one's goals, (e) managing one's *time use* efficiently, (f) *self-evaluating* one's methods, (g) *attributing* causation to results, and (h) *adapting* future methods. (p. 66)

Zimmerman (1990) defines self-regulated learning strategies as "actions and processes directed at acquisition of information or skills that involve agency, purpose, and instrumentality perceptions by learners" (p. 5). To be more specific, Zimmerman and Martinez (1986, cited in Zimmerman, 1989) found fourteen types of self-regulated learning strategies. The main categories are listed below:

1. Self-evaluating
2. Organizing and transforming
3. Goal-setting and planning
4. Seeking information
5. Keeping records and monitoring
6. Environmental structuring
7. Self-consequating
8. Rehearsing and memorizing
9-11. Seeking social assistance
12-14. Reviewing records

According to Cho (2010) and Torrano and Torres (2004) studies show that self-regulated learners are active and they generally make use of the following activities:

1. Cognitive activities: rehearsal, elaboration, and organization
2. Metacognitive activities: goal setting, self-monitoring, and self-evaluation
3. Recourse management activities: time and effort management, seeking help from others, and structuring environment
4. Affective activities: self-efficacy and volition (will power to accomplish certain jobs)

Self-regulated learners are not only supposed to succeed academically but to develop long-life learning skills. Enhancing these skills is seen as a major function of education (Zimmerman, 2002). Studies show that learners do not learn self-regulated strategies automatically and that the development of self-regulated strategies does not develop with age (Lapan, 2010; Orhan, 2007). On the other hand, research shows that self-regulated learning is teachable and can lead to increase in students' achievement (Abrami et al., 2010; Mirhassani, Akbari, & Dehghan, 2007; Orhan, 2007; Sanz De Acedo & Iriarte, 2001; Tseng, Dornyei, & Schmitt, 2006). However, Zimmerman (2002) states that learners are rarely given choices to practice self-regulation in academic settings. A self-regulated learning perspective has implications for the ways teachers should interact with students. In this regard, different scholars have made suggestions to promote self-regulated learning. The following are some general guidelines for enhancing self-regulation suggested by Torrano and Torres (2004), and Lapan (2010).

1. Direct teaching: Self-regulation can be taught directly by explaining the strategies that can help or hinder the learning process to the students.
2. Modeling: Modeling is an indirect way of teaching self-regulation. In this procedure students observe the teacher performing self-regulation strategies.
3. Practice: Practicing overt and covert strategies can be done through a variety of learning tasks. It can be done first guided and then independently. Overt strategies are those that can be seen, such as underlying and note taking, while covert strategies are referred to as internal mental processes, such as imagery or relating new information to prior knowledge.
4. Self monitoring: Students can self-monitor themselves by making use of internal and external factors, on the one hand and setting short term realistic and specific goals, on the other hand.
5. Self-evaluating: Evaluating their own performance, students will understand the benefits of self-regulated learning. In this regard, Paris and Winogard (2011) state that teachers can help learners to think of failure as a constructive process. That is, teachers should help students realize how to respond to the failure matters not the failure itself. Analyzing the reasons behind the failure can help learners to revise their approach to learning, and start over with better plans.

Different studies investigated the role of self-regulated strategies and language learning and found positive relationship between application of self-regulated learning strategies and success in language learning (Abrami et al., 2010; Mirhassani, Akbari, & Dehghan, 2007; Orhan, 2007; Sanz De Acedo & Iriarte, 2001; Tseng, Dornyei, & Schmitt, 2006). Research has also depicted that self-regulation facilitates reading ability in particular (McMahon & Dunbar, 2010; Nash-Ditzel, 2010; Swalander & Taube, 2007).

Furthermore, Nash-Ditzel's (2010) study showed that teaching techniques based on self-regulation and reading strategies could significantly promote improved reading abilities in college students. Using interviews, think-aloud protocols, informal observations, and document analysis, Nash-Ditzel found that the knowledge and ability to use reading strategies contributed to the students' ability to self-regulate while reading.

McMahon and Dunbar (2010) showed that empowering learners through self-regulated online learning, rather than traditional learning approach, based on knowledge transfer, develops students' independent skills in reading and understanding academic texts. In their study, the participants used on-line environment to promote their reading

comprehension through a process of scaffolded reciprocal teaching. Students engaged in tasks that required the use of a specific set of tools, such as links and discussion boards to share idea about the visual context.

Swalander and Taube (2007) investigated the effect of self-regulated learning on reading ability. The results showed that family-based prerequisites, academic self-concept, and reading attitude significantly influenced reading ability. Academic self-concept showed a direct and strong influence on goal-oriented strategies and on reading ability in the eighth grade Swedish students.

## III. METHODOLOGY

Since reading is a multidimensional skill involving a variety of cognitive, linguistic, and non linguistic factors, teaching it is a complex matter. The main purpose of the present study is investigating the effect of self-regulation on EFL learners' reading comprehension.

### Participants

The type of sampling employed in this study was purposive. That is, sample groups were judged to be representative of the population (Ary, Jacobs, & Razavieh, 1996).

A sample of 149 female and male Iranian EFL language learners studying at Islamic Azad Universities of Qazvin and Tehran (North, and Science and Research Branches) participated in this study. As is typical of Iranian EFL learners, females outnumbered males. Since the ratio of males to females could not be kept constant in each class, gender was excluded from the analysis. With regard to the learners' first language, the participants were monolingual whose native language was Persian, and English was the foreign language they were learning.

The participants were selected on the basis of their language proficiency scores from a population of 200 EFL learners. The 2003 version of the paper-based TOEFL (PBT) was administered to all learners. Learners whose scores were within plus and minus one standard deviation based on the TOEFL mean score were considered in this study. From this population a sample of 149 participants were selected.

Based on the participants' performance on the language proficiency, six classes were randomly assigned to experimental and control groups.

### Instrumentation

The TOEFL PBT was administered as a standardized measure to check the homogeneity of subjects in terms of language. The test reading comprehension section was also used as a means for assessing the students' reading comprehension in pre-testing and post-testing. The test was administered in 50 minutes.

### Data Collection Procedure

The procedure followed to carry out the present study is described in three phases of pre-treatment, treatment, and post-treatment.

**Pre-treatment:** First, the TOEFL PBT was administered to all participants. The TOEFL was used to homogenize students regarding language proficiency level, and, at the same time, its reading section was used as a means to measure the students' reading comprehension (pre-test). Then, the participants were randomly put into experimental and control groups. Since there were six classes, three classes, which received treatment, were considered as the experimental group, and the remaining three classes as the control group.

**Treatment:** In this phase, the experimental group received direct teaching of self-regulation strategies in reading, along with task-supported instruction, in ten sessions. To implement the treatment, each session, the researcher first introduced the topic of the reading text to activate the students' schemata. Then, she gave the students a sense of purpose for reading by informing them that self-regulation process would help them to be an active reader, and that they would be able to control the reading process, their behavior, and their environment better by applying self-regulation strategies while reading. For example, the researcher introduced environmental structuring, which was the first self-regulation strategy in their task sheet (Appendix), as follows:

Teacher: Environmental structuring is one of self-regulation strategies which help you to make your learning process easier by selecting or arranging your physical setting. To do so, you can isolate, eliminate, or minimize distractions. You can also break up your study period and spread it over time.

Then the students had to apply those strategies in the form of the designed tasks/activities which are described below. The tasks/activities were based on self-regulation strategies proposed by Zimmerman (1989) (see Table 1). The strategies included in eight categories, which had to be carried out successively (see Appendix):

1. Environmental Structuring
2. Organizing and Transforming
3. Goal Setting and Planning
4. Keeping Records and Monitoring + Organizing and Transforming
5. Seeking Information + Seeking Social Assistance
6. Rehearsing and Memorizing
7. Reviewing Records
8. Self-evaluation + Self-consequating

The tasks/activities in the environmental structuring category required the students to pay attention to the environment and find the distractions, such as air conditioner and their classmates' whispering. Then they had to write

if they could have adjusted the situation for the better results, or they should have tolerated the distractions. Organizing and transforming tasks/activities, however, helped the students to take a quick look at the text before reading to see how the text is organized in terms of title, heading, sub-heading, and paragraphs. The tasks/activities in goal setting and planning category got students to guess how much time they needed to read the text and do the activities. Therefore, they learned to budget their time in advance. The tasks/activities in the next category focused on keeping records and monitoring, as well as organizing and transforming strategies. Here, the students were required to read the text paragraph by paragraph, draw an outline, and highlight the ambiguous words, phrases, or sentences for further investigation. The tasks/activities in the fifth category assisted the readers to seek information and social assistance. To do so, they specified which ways they would like to use to remove the ambiguities they had encountered in the previous phase. Rehearsing and memorizing tasks/activities drew students' attention to the strategies that helped them to memorize unfamiliar words. So, they were required to check the strategies that seemed most useful to them. Tasks/activities related to reviewing record strategy asked students to go back to the previous phases and check if they had taken all the steps, and they had to remove any unclear points before going to the next phase. Finally, there were self-evaluation and self-consequating tasks/activities that required students to self-evaluate themselves by answering some questions about their performance, such as how they scored themselves and how they did the activities.

An example of tasks/activities is provided below. Taking environmental structuring strategy as an example, the students in the experimental group were required to practice this strategy in the form of the following task/activity.

### Task: Environmental Structuring
Pay attention to your environment. What distracts you? How can you change the situation for the better?

| Distractions | I can adjust it by … | I should tolerate it |
|---|---|---|
| Air conditioner | | |
| People's whispering | | |
| Noise from outside the room | | |
| Your thoughts | | |
| Others: ---------------- | | |

Therefore, every session, the students in the experimental group practiced self-regulation strategies on a reading text. However, the control group did not receive any treatment on self-regulation either directly or indirectly. Their classes were conducted in the traditional way; that is they were only required to read the reading texts and to do the follow-up tasks/activities of the book without any reference to self-regulation.

In other words, both groups enjoyed the same time exposure every session. In practice, both followed three phases of pre-reading, during-reading, and after-reading. The only difference was the explanation and application of self-regulation strategies, which were not practiced in the control group. After introducing the topic, the students in the control group were given time to read the text. Then they were required to do routine reading activities, such as comprehension questions and vocabulary study.

It is worth mentioning that task-supported teaching was selected as a means of instruction for the experimental group because it teaches learners how to proceduralize strategic solutions to problems (Skehan, 1996). Equally important, task-supported instruction has strong empirical evidence (Nunan, 1991). Furthermore, it focuses on meaning, real word relationship, and outcome (Prabhu, 1987, Skehan, 1996) which are of interest in self-regulation.

Since studies show that learners do not learn self-regulated strategies automatically and that the development of self-regulated strategies does not develop with age (Lapan, 2010; Orhan, 2007), the students who did not receive treatment were considered as non self-regulated learners.

**Post-treatment:** Having practiced ten sessions of reading, the participants in both groups took the very reading comprehension section of the TOEFL as reading comprehension post-test.

TABLE 1
*SELF-REGULATED LEARNING STRATEGIES* (ADAPTED FROM ZIMMERMAN, 1989 & NRC/GT, 2011)

| Category definitions | Substrategies |
|---|---|
| **A. Personal.** These strategies usually involve how a student organizes and interprets information and include:<br>• *Organizing and transforming:* Self-initiated overt or covert rearrangement of instructional materials to improve learning. | • Outlining<br>• Summarizing<br>• Rearrangement of materials<br>• Highlighting<br>• Drawing pictures, diagrams, charts<br>• Flashcards/ index cards<br>• Webs/mapping |
| • *Goal-setting and planning:* Setting educational goals or subgoals and planning for sequencing, timing, and completing activities related to the self-set goals. | • Sequencing, timing, completing<br>• Time management and pacing |

(Table 1 continues)

(TABLE 1CONTINUED)

| | |
|---|---|
| • *Keeping records and monitoring:* Self-initiated efforts to record events or results. | • Note-taking<br>• Lists of errors made<br>• Record of marks<br>• Portfolio, keeping all drafts of assignments |
| • *Rehearsing and memorizing:* Self-initiated efforts to memorize learning materials by overt or covert practice. | • Mnemonic devices<br>• Teaching someone else the material<br>• Making sample questions<br>• Using mental imagery<br>• Using repetition |
| • *Reviewing records:* self-initiated efforts to reread notes, tests, or textbooks to prepare for class or further testing. | • Rereading records, tests, textbooks<br>• Reviewing cards<br>• Checking if something is missing |
| **B. Behavioral:** These strategies involve actions that the student takes.<br>• *Self-evaluation:* Self-initiated evaluations of the quality or progress of students' work. | • Task analysis (What does the teacher want me to do? What do I want out of it?)<br>• Self-instructions; enactive feedback<br>• Attentiveness |
| • *Self-consequating:* Student arrangement or imagination of rewards or punishment for success or failure. | • Treating to motivate; self-reinforcement<br>• Arrangement or imagination of punishments; delay of gratification |
| **C. Environmental:** These strategies involve seeking assistance and structuring of the physical study environment.<br>• *Seeking information:* Self-initiated efforts to secure further task information from nonsocial sources. | • Using library resources<br>• Using Internet resources |
| • *Environmental structuring:* Self-initiated efforts to select or arrange the physical setting to make learning easier. | • Selecting or arranging the physical setting<br>• Isolating/ eliminating or minimizing distractions<br>• Breaking up study periods and spread them over time |
| • *Seeking social assistance:* Self-initiated efforts to solicit help from peers, teachers, and adults. | • Asking from peers<br>• Asking from teachers or other adults<br>• Emulating exemplary models |

## IV. RESULTS AND ANALYSIS

In order to investigate the effect of self-regulation on EFL learners' reading comprehension the following analyses were run:

The TOEFL was administered to 200 participants at three branches of Islamic Azad University, namely Qazvin Branch, Science and Research Branch, and Tehran North Branch. Based on the mean scores plus and minus one standard deviation, 149 cases whose scores were between 13 and 27 were selected to participate in the main study.

An independent t-test was run to compare the mean scores of the experimental and control groups on the pretest of reading comprehension in order to prove that they enjoyed the same level of reading comprehension ability prior to the main study. As displayed in Table 2, the mean scores for the experimental and control groups are 13.38 and 13.01 on the pretest of reading comprehension

TABLE 2
DESCRIPTIVE STATISTICS PRETEST OF READING COMPREHENSION

| GROUP | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Experimental | 76 | 13.38 | 4.013 | .460 |
| Control | 73 | 13.01 | 5.184 | .607 |

The results of the independent t-test (t (147) = .48, ns, P > .05,it did represent a small-sized effect (r = .040) indicate that there is not any significant difference between the mean scores of experimental and control groups on the pretest of reading comprehension. Thus, it can be concluded that the two groups enjoyed the same level of reading comprehension ability prior to the main study.

TABLE 3
INDEPENDENT t-TEST PRETEST OF READING COMPREHENSION BY GROUPS

| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | F | Sig. | t | Df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | Lower | Upper |
| Equal variances assumed | 4.927 | .028 | .485 | 147 | .628 | .368 | .758 | -1.130 | 1.865 |
| Equal variances not assumed | | | .483 | 135.61 | .630 | .368 | .762 | -1.138 | 1.874 |

*It should be noted that the assumption of homogeneity of variances is not met (Levene's F = 4.92, P = .028 < .05). However due to the fact that the ratio of the larger sample size over the smaller sample size (76/73=1.04) is lower than 1.5 (Pallant 2005), there is no need to worry about the violation of the assumption.*
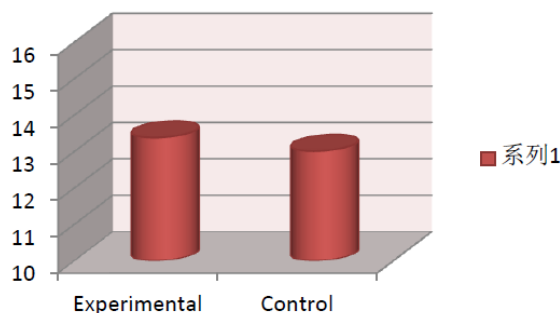

Figure 3 Pretest of reading comprehension by groups

The research question investigated the effect of self-regulation on EFL learners' reading comprehension. The question, along with the findings are presented and discussed below.

Concerning the reading comprehension of the experimental and control groups, an independent t-test was run to compare the mean scores of the experimental and control groups on the reading comprehension posttest in order to investigate the effect of the treatment on the improvement of the reading comprehension of the EFL learners. Table 4 shows that the mean scores for the experimental and control groups are 17.68 and 10.34, respectively.

TABLE 4
DESCRIPTIVE STATISTICS: POSTTEST OF READING COMPREHENSION BY GROUPS

| GROUP | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Experimental | 76 | 17.68 | 4.122 | .473 |
| Control | 73 | 10.34 | 3.010 | .352 |

Regarding the posttest of reading comprehension in the experimental and control groups, Table 5 demonstrates the results of the independent t-test. The findings indicate that there is a significant difference between the mean scores of the experimental and control groups on the posttest of reading comprehension, t (147) = 12.3, P < .05. It indicates a large-sized effect (r = .71). Thus, the null-hypothesis stating that there is no statistically significant difference between reading comprehension of self-regulated readers and non self-regulated readers is rejected. The result of the analysis is presented in Figure 4.

TABLE 5
INDEPENDENT T-TEST: POSTTEST OF READING COMPREHENSION BY GROUPS

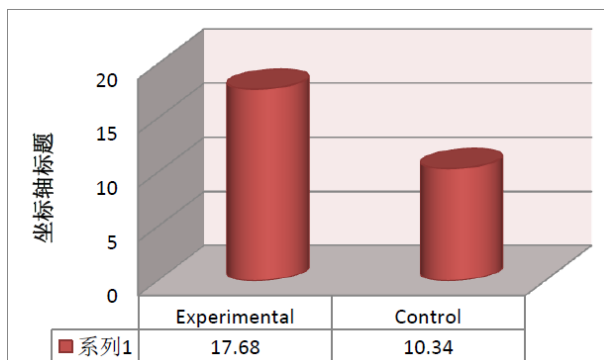| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
|---|---|---|---|---|---|---|---|---|---|
| | F | Sig. | T | Df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Equal variances assumed | 6.142 | .014 | 12.3 | 147 | .000 | 7.342 | .593 | 6.169 | 8.514 |
| Equal variances not assumed | | | 12.4 | 137.30 | .000 | 7.342 | .590 | 6.176 | 8.508 |


Figure 4 Posttest of reading comprehension by groups

V. DISCUSSION OF THE RESULTS

The outcome of this part clarified that self-regulated learning had a significant effect on EFL learners' reading comprehension. That is to say the use of self-regulation reading tasks/activities (see Appendix), which were designed based on self-regulation strategies (Zimmerman, 1989), significantly increased learners' reading comprehension. In other words, it can be concluded that teaching techniques based on self-regulation can significantly promote reading performance in college students, and it develops students' independent skills in reading.

It is worth rementioning that in this study the concept of self-regulation was narrowed down to eight categories of strategies in reading. The strategies were based on Zimmerman's self-regulation strategies tapping three areas of personal, behavioral, and environmental influences. The participants in the experimental group were exposed to explicit teaching on self-regulation strategies through instructors' explanation, along with task-supported teaching; they had to apply what they had been taught on different reading texts in task-supported forms. On the other hand, the researcher did not introduce the concept of self-regulation to the control group.

The findings are consistent with earlier research on self-regulation (McMahon & Dunbar, 2010; Nash-Ditzel, 2010; Swalander & Taube, 2007). In the same line with this study, Nash-Ditzel (2010), found that teaching techniques based on self-regulation and reading strategies can significantly promote reading abilities in college students. McMahon and Dunbar (2010) also reported that empowering learners through self-regulated on-line learning develops students' independent skills in reading and understanding academic texts. Finding a positive impact of self-regulated learning on reading ability, Swalander and Taube's (2007) study showed that academic self-concept significantly influenced reading ability. Academic self-concept showed a direct and strong influence on goal-oriented strategies and on reading ability in Swedish participants. Swalander and Taube assert that one of the important duties of educators at school is strengthening students' trust in their own ability to succeed in literacy activities and to assign a positive value to reading.

## VI. CONCLUSION

This paper aimed at investigating the effect of self-regulation on EFL learners' reading comprehension. From the findings of this study, it could be concluded that the application of self-regulation in reading enhance EFL learners' reading comprehension.

Therefore, language teachers, specifically those teaching the reading skill are highly recommended that they include more educational practices on self-regulation in their teaching. This matter can guarantee both the leaning of the students and increasing their motivation which is by itself an improvement factor in learning too. On a larger scale, inclusion of tasks/activities based on self-regulated learning in textbooks encourage the students to participate actively in their learning process, see themselves as agents of their own learning, and develop their independent skills.

## APPENDIX

**Self-regulation Reading Tasks**

**You are going to go through some reading self-regulation phases which help you to be an active reader metacognitively, motivationally, and behaviorally. Therefore, you will be able to control yourself, your behavior and your environment better while reading.**

**Please fill in the charts and answer the questions as recommended below, and then e-mail the complete form to me.**

*1. Environmental Structuring*

Listen to your environment. What distracts you? How can you change the situation for better?

| Distracters | I can adjust it by ------- | I should tolerate it |
|---|---|---|
| 1. Air conditioner | | |
| 2. People's whispering | | |
| 3. Noise from outside the room | | |
| 4. Your thoughts | | |
| 5. Others: ---------------- | | |

*2. Organizing and Transforming*

Take a quick look at the text, and then complete the following chart.

| Questions | Answers |
|---|---|
| 1. What is the title of the text? | |
| 2. How many paragraphs are there in the text? | |
| 3. How many headings are there in the text? | |
| 4. How many subheadings are there in the text? | |

*3. Goal Setting and Planning*

Before treading the text, go through the following steps:

1. Go over the pre-reading questions.

2. Guess how much time you need to read the text and do the activities:

> I guess I need -------------- minutes to go through the text and do the activities.

### *4. Keeping Records and Monitoring + Organizing and Transforming*
Read the text paragraph by paragraph. Please take the following steps in this phase:

> 1. If you face any ambiguous word, phrase or sentence, take one of the following steps to highlight them for further investigation:
> • annotating
> • underlining them
> • jotting them down on your notebook
> Is there any other way you would like to use to highlight them? If yes, please specify?
> -------------------------------------------------------------------------------------------------
> 2. Draw an outline for the paragraph.
> 3. Write a 1-3 sentence summary according to your outline.

### *5. Seeking Information + Seeking Social Assistance*
Which of the following ways did you use or would you like to use to remove the ambiguities in the previous phase? Please specify them.

| Ways | I tried this way to ------------------------------- |
|---|---|
| Guessing | |
| Surfing the net | |
| Asking the teacher | |
| Asking your friends | |
| Consulting a dictionary | |
| Others: ------------------------- | |

### *6. Rehearsing and Memorizing*
Which strategy helps you most to memorize the new words? Please put a check mark on the following list (You may check more than one option).

| Strategy | |
|---|---|
| Writing them down | |
| Using mental imagery | |
| Using repetition | |
| Using flash cards | |
| Sticking them on the wall | |
| Learning them from the context | |
| Learning them through derivation | |
| Recording and then listening to them | |
| Building them through synonyms or antonyms | |
| Others: -------------------------------- | |

### *7. Reviewing Records*
Go back to the previous phases and check the following:
Have you taken all the steps?
Is there any unclear point? If so, remove it before going to the last phase.

### *8. Self-evaluation + Self-consequating*
Self-evaluate yourself and answer the following questions.

> 1. How much did you get the text?
> 100%                50-100%                less than 50%
> ---
> 2. Which phase helped you more to deal with the text?
> ------------------
> ---
> 3. Have you done the activities correctly?
>       All of them              Most of them                Some of them
> ---
> 4. Was your time estimation correct?
> Yes                          No
> ---
> 5. How was your performance in general?
> Very well            So-so                          Not satisfactory
> ---
> 6. How do you score yourself from 1 to 20?
> ------------------
> ---
> 7. Is there anything else you would like to add about your performance? Please specify (you may specify it in Persian)?
> -------------------------------------------------------------------------------------------------
> ---
> 8. How do you like this way of reading a text?
> Merits: -------------------------------------------------------------------------------------------------
> Demerits: -------------------------------------------------------------------------------------------------

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