The Effect of Self-Regulation Based Strategic Reading Education on Comprehension, Motivation, and Self-Regulation Skills*

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Abstract

The changes occurred in science and technology affect the content of education directly. In alignment with this change, the upbringing of students from an early age to be able to adapt and improve in alignment with the changing life conditions, to take learning responsibilities, to solve problems, to be able to think critically, to be entrepreneurial and to have communication skills is directly related to models and methods used in their learning environments. With self-regulated education that emerged in alignment with this perspective, students follow a path that is cognitively, motivationally and behaviorally active during their education. The purpose of this study is to identify the effects of self-regulation based strategic reading on the comprehension, reading motivation and self-regulation skills of 5th grade students. The study was conducted in two middle schools that are in the middle level socioeconomically in the city of Aksaray. An experimental model with pre-test and post-test control group was used in the study. Paired groups were assigned to experiment and control groups randomly in alignment with the research design. In the test group, a program geared towards improving self-regulation based reading skills was used while the current education program is used in the control group. Reading comprehension scale, motivation and learning strategies scale, reading motivation scale, and reading strategies scale were used as data collection instruments. The findings showed that self-regulation based strategic reading education has an effect on reading comprehension, motivation and self-regulation skills.

Keywords: Turkish education, Self-regulation based learning, reading comprehension, motivation, self-regulation skills.

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INTRODUCTION

Rapid changes occurring in science and technology concern individuals' lives closely. Individuals can adapt to the change by acquiring life-long learning skills. Educational programs should be structured in a way to help students acquire skills to regulate their life-long learning. Students with self-regulation skills have skills such as problem-solving, critical thinking, entrepreneurial and communication as well as skills for regulating their own learning.

Regulation of one's own learning activity depends on the person's awareness of their own learning and skills, structuring information and engaging with the learning process actively. One of the most critical language skills an individual can use during the process of life-long learning is reading. Thus, a strong foundation for reading education should be provided during elementary education. Students encounter new information, incidents, and experiences by accessing different resources through the reading skill. This skill entails a process including learning, researching, interpreting, discussing and critical thinking. An individual's success in academic life and afterwards is possible with having an advanced level of reading skills. When successful readers' characteristics are evaluated, it is seen that they use cognitive and metacognitive reading strategies effectively, they have reading motivation, and regulate their own learning by using self-regulating strategies. Studies conducted in recent years focus on self-regulated learning in which individuals take the responsibility for their own learning (Azevedo, Moos, Grene, Winters & Cromley, 2008; Bates, 2006; Cabı, 2009; Camahalan, 2006; Eker, 2012; Graham, Haris & Mason, 2005; Gülay, 2012; İsrael, 2007; Müldür, 2017; Oruç, 2012; Tolaman, 2017; Uyar, 2015; Uygun, 2012; Zumbrunn & Bruning, 2013). It is seen that studies mostly focus on the effects of self-regulation on writing skills, academic success, attitude, persistency, and perceptions of self-efficacy. The current study focused on the effects on reading comprehension, motivation, and self-regulation skills.

Self-Directive Learning Process

Self-regulation is the skill of regulating cognition, behaviors, actions and motivations strategically and autonomously in academic skills and learning to reach the identified goals. Pintrich (2000) defines self-regulation, which is one of the fundamental principles of social cognitive theory, as a structuring process that students identify goals for their learning, regulate and control their cognition and behaviors while Schunk (1989; as cited in Schunk, 1994, p.75) defines it as activities such as an individual's engagement and concentration in the learning process, organization, coding and repetition of knowledge to be remembered, creation of an efficient study environment and use of resources efficiently, having positive belief in the results of expected behaviors, value of learning, factors affecting learning, and feeling happy with efforts made. According to Risenberg and Zimmerman (1992), self-regulation is to identify goals and using strategies to achieve these goals, and monitoring the outcomes closely. Zimmerman (2008) examined self-regulated learning in terms of processes including identifying goals, strategic planning, selecting and using strategies, self-monitoring and self-assessment skills, learning and remembering information and academic skills. Self-regulation based learning definitions share a common view that students follow an active path in terms of cognitive, motivation and behavior in their learning processes.

When the literature is examined, it is seen that different models for self-regulated learning were developed by Boakerts, Borkowksi, Winne, Zimmerman and Pintrich (Aydın & Atalay, 2015). The current study is framed with Zimmerman & Pintrich's sociocognitive self-regulation models. Zimmerman considers self-regulation not as an intellectual skill or academic trait but as a self-oriented process in which students transform their intellectual skills into academic skills (Zimmerman, 1998, p.1-2; Zimmerman, 2002). According to the sociocognitive theory, learning is not only influenced by personal processes but also environmental and behavioral incidents (Zimmerman, 1998).

Self-regulation process includes three phases from a social cognitive theory perspective. These phases are forethought phase, performance phase and self-reflection phases. Forethought phase refers

to processes that reveal efforts before behaviors and the behavior. It has two sub-categories that are distinctive but related; task analysis and self-motivation beliefs. There are two types of task analysis that are goals setting and strategic planning. In this process, first goals related to learning are identified and second, strategies are planned to achieve the identified goals (Zimmerman, 2000, p.17). Self-motivation beliefs plays an important role in goal setting and strategic planning. These beliefs are self-efficacy, outcome expectations, intrinsic interest/value, and goal orientation (Zimmerman, 2000, p.17). Self-efficacy describes an individual's beliefs on learning behaviors at identified levels and their beliefs on their skills (Bandura, 1986, 1997). Research show that self-efficacy predicts students; academic motivation and learning (Pajares, 1996; Schunk, 1995, 1996). While outcome expectations is related to the outcome of a person's performance, it also shows motivation. Intrinsic interest/value is the responsibility that an individual feels for learning and mastering a task. Goal orientations can be described as the main reasons for individuals to engage in certain tasks, courses or activities (Anderman, Austin and Johnson, 2002, p.198).

There are two important processes, self-control and self-observation, in the second phase of self-regulated learning. Self-control involves the regulation and use of certain methods and strategies during the performance process. The sub-processes of this dimension includes imagery, self-instruction, attention-focusing, and task strategies (Zimmerman, 2000, p. 18- 19). The second important element of the performance phase is self-observation which refers to observing one's own performance and environmental factors impacting the performance during the process (Zimmerman, 1998, p.2-5).

During the self-reflection phase, students react to the efforts they make and engage in self-assessment (Zimmerman & Schunk, 2004). This phase consists of self-judgment and self-reaction dimensions. Self-judgement is concerned with an individual's evaluation of performance and characteristics. Judgements based on self-assessment are judgements based on causes (Zimmerman, 2000, p.21). Self-reaction process is more concerned with internal evaluation and causal attribution and consists of self-satisfaction/affect and adaptive and defensive processes.

Self-Regulating Learning Strategies

Self-regulating learning strategies refer to a series of metacognitive and behavioral methods a student can use to control their own learning process (Zimmerman & Martines-Pons, 1986; Zimmerman, 1990). According to Zimmerman (1990), self-regulating learners are aware of the information and skills they need to possess at a certain situation and they take the necessary steps to acquire those skills and information. Pintrich & De Groot (1990) state that self-regulating learning strategies include students' metacognitive strategies and self-management.

Self-regulating learning model includes three general strategies that are cognitive learning strategies, metacognitive strategies, and resource management strategies.

Cognitive strategies are strategies related to cognitive process and behaviors that students use to accomplish a task or a goal during their learning (Eker, 2012, p.33). Weinstein & Mayer (1986, as cited in Pintrich, 1999, p.460) define the most important cognitive strategies related to academic performance in classroom as repetition, detailing, and organizing strategies. Repetition strategies include tasks such as repeating, highlighting and summarizing information (Schunk, 2009). Detailing strategies are those that help students to store information in long-term memory rather than copying the information as it is, to take notes by re-organizing ideas, to ask and answer questions (Kayıran, 2014, p.28). Organizing strategies include use of several methods for drawing key ideas from a text, summarizing what's learned, selecting important ideas, and organizing (Pintrich, 1999; Hoffer et al., 1998 as cited in Aydın & Atalay, 2015, p.9).

Meta-cognitive self-regulation strategies are those that students use to plan, observe and regulate their cognitive strategies (Boakearts, 1999, p.454). Flavell (1976, p.231) defines meta-cognition as "an individual's knowledge on cognitive procedures and outcomes or anything related to

these." Schraw & Moshman (1995) states that there are two elements of meta-cognition that are cognition information and regulation of cognition. İnformation on cognition involves students' information on individual, task, and strategy variables while self-regulation of cognition involves students' observation, control, and regulation of self cognitive activities and behaviors. Regulation of cognition consists of planning, observing, and regulation strategies. Planning strategies include activities such as setting goals for studying, reviewing a text before reading, raising questions, and problem task analysis (Kayıran, 2014, p.29). Observation strategies include self-judgment skills to control learning (Schraw et al., 2006). A person's observation of self-learning process is important for academic success. It involves monitoring whether progress has been made in alignment with set goals by using criteria identified, and whether there are any issues in the learning process during meta-cognitive observation process (Harvey and Goudvis, 2007, p. 77-78; Thiede, Griffin, Wiley and Redford, 2009, p. 85; Zwiers, 2010, p. 173-201; as cited in Uyar, 2015, p.66)). Regulation strategies include a students' evaluation of the learning process by evaluating its compatibility with cognitive activities, and the results.

Resource management strategies is related to efficient use of opportunities that are around to achieve goals (Eker, 2012). These strategies include students' management and control of their teachers and peers by using efforts, study environments, and strategies to asking for help (Zimmerman & Martinez-Pons, 1986). These strategies help students to adapt and change their environments according to their goals and needs (Kayıran, 2014, p.30).

Zimmerman & Martinez-Pons (1986) identified certain self-regulation strategies used by student during the learning process:

1. *Self-judgment:* Evaluation of a students' learning process and its quality.

2. *Organization and transformation:* Creating learning materials and plans to organize the learning process of students.

3. *Setting goals and planning:* Student's engagement with identifying goals and making plans to achieve these goals.

4. *Searching for information:* Students' engagement with obtaining knowledge from multiple resources to complete their tasks.

5. *Note taking and observing:* Students' engagement with documenting the incidents and outcomes.

6. *Organizing the environment:* Organization of the learning environment by students.

7. *Internal results:* Identification of awards and punishments or arrangements for successful and unsuccessful results by students.

8. *Memorizing and repetition:* Memorizing or repeating explicitly or privately in order to remember what's learned.

9. *Seeking for social support:* Receiving support from peers, teachers and adults.

10. *Reviewing notes:* Review of notes, exams or textbooks by students.

Considering the strategies students use, it is seen that they use cognitive, meta-cognitive and resource management strategies of self-regulation.

Reading Education Based on Self-Regulation

Reading is a foundational learning field that contributes to language and cognitive skills (Güneş, 2014, p.127). According to Ülper (2010, p. 3), reading is a meaning making process in which individuals, who recognize the semantic and grammatical characteristics of the language of the text, engage in decrypting codes and using strategies in alignment with certain goals. Reading is a multidimensional learning field including cognitive, affective, and kinesthetic aspects. The purpose of the reading process is to make meaning of a text completely and accurately. The reading comprehension process involves finding meaning, thinking on the meaning, searching for causes, drawing conclusions and evaluation. Comprehension includes mental activities such as reviewing, selecting, interpretation, translating, analysis and synthesis (Balcı, 2013, p.14).

A good reader is has the skills of reading comprehension, can read the text with methods compatible with the structure of the text, and has a critical perspective. Akyol (2014) describes the things a good reader should do as:

"A good reader engages with a text with the expectation of meaning making. First, the reader reviews the text quickly to determine the type and identifies the purpose of the reading. Then, transfers his prior knowledge on the topic to the reading environment. A good reader controls the comprehension, asks questions to himself, creates imagery, examines important points more carefully, and clarify complex statements during reading. If the reader does not reach an open and clear outcome on the meaning of the text or the paragraph, then he uses strategies to help in the process. Re-reading the section that was not understood or asking for help from the teacher or a peer are examples of such strategies. After finishing the reading, a good reader summarizes the text appropriately, critiques and evaluates the text. This process should be experienced by all students effectively." (Akyol, 2014, p. 33-34).

A good reader regulates his own reading process, observes their own reading, and act strategically. Ülper (2010) describes the strategies that a reader should do before, during, and after the reading process as;

1. *Strategies before Reading:* These strategies are defined as organizing strategies by Asubel and they allow the reader to be prepared for the reading.

   ✓ Identifying the purpose of the reading,

   ✓ Identifying the type and pace of text according to the purpose,

   ✓ Making predictions based on the text visuals,

   ✓ Making predictions based on the title, sub-titles, and boldified or italicized sections of the text,

   ✓ Discussing predictions with peers,

   ✓ Reviewing the introduction and conclusion sections of the text,

   ✓ Searching for key words reflecting the topic of the text,

   ✓ Looking up the definitions of unknown words,

   ✓ Activating the structural schema.

   ✓ Strategies during reading: These are strategies that a reader can use in the phase after preparing himself to read and make meaning of a text by using strategies before reading.

✓ Predicting the meaning of words,

✓ Predicting semantic relationship,

✓ Predicting and approving the message of the text through elements such as title, headings, sub-headings, visuals, etc. as the reading progresses,

✓ Reading at a pace that is compatible with the purpose of reading,

✓ Utilizing the activated structural schema,

✓ Reviewing the questions related to the text raised prior to reading and correcting,

✓ Creating a visual imagery,

✓ Paying more attention to important information in the text than other information,

✓ Making notes of important sections,

✓ Highlighting or circling key messages, pausing at times to evaluate what's read,

✓ Reading by skipping some words or sentences and going back to these pieces later,

✓ Discussing with peers after reading,

2. *Post-Reading Strategies:* These are the strategies to be used after reading a text based on strategies for pre-and during reading.

✓ Reviewing pre-reading expectations and drawing conclusions,

✓ Reviewing highlighted parts and notes taken during reading,

✓ Summarizing the text,

✓ Discussing the text with peers after reading,

✓ Answering questions related to the text read,

✓ Completing the semantic map of the text read,

✓ Critiquing and making judgement on the text.

Students need to identify goals, use reading strategies effectively, observe their comprehension, and evaluate their progress towards their goals during reading. Uyar (2015, p.82) defines self-regulated reading as a process in which reader uses cognitive resources effectively, observes and controls the comprehension process meta-cognitively, control and organize all variables affecting the process including environmental resources and is highly motivated. In the current study, the purpose of developing reading skills in alignment with the self-regulated learning model is due to the compatibility of activities used by a successful reader before, during, and after reading with the prediction, performance, and evaluation phases of the self-regulated learning perspective. This study is significant in that the reading program applied would provide guidance for students who have trouble in comprehending, and contribute to the field.

Purpose of the Study

The purpose of the study is to identify the impact of self-regulated reading strategy teaching on the comprehension, reading motivation and self-regulation skills of 5th grade students. Within this context, following hypotheses were tested:

1. When the pre-test scores of the test group consisting of students with self-regulation based learning skills and the control group consisting of students educated with the Turkish Teaching Program, are controlled for, the test group shows a significant difference in the post-test scores.

2. When the pre-test scores of students' reading strategies cognitive awareness strategies of the test group consisting of students with self-regulation based learning skills and the control group consisting of students educated with the Turkish Teaching Program, are controlled for, the test group shows a significant difference in the post-test scores.

3. When the motivation pre-test scores of the test group consisting of students with self-regulation based learning skills and the control group consisting of students educated with the Turkish Teaching Program, are controlled for, the test group shows a significant difference in the post-test scores.

4. When the motivation and learning strategies pre-test scores of the test group consisting of students with self-regulation based learning skills and the control group consisting of students educated with the Turkish Teaching Program, are controlled for, the test group shows a significant difference in the post-test scores.

METHODOLOGY

Research Model

In this study, the effect of self-regulation based learning and reading strategies on students' comprehension, reading motivation and self-regulation skills were examined. The design of the study is in experimental nature. In the experiment setup, participants matched for characteristics were randomly assigned to groups. In this setup, one test and one control group were used. Both groups completed a pre- and a post- test. The intervention was done only in the test group for the independent variable (Karasar, 2017, p.130)

Table 1. Classical Experiment Design

Group	Measurement$_1$	Intervention	Measurement $_2$
Control	Pre$_1$	–	Post$_1$
Test	Pre$_2$	Self-regulation based strategic reading education	Post$_2$

In a classical test setup, no significant difference is expected between the pre- and post-test scores (Post$_1$-Pre$_1$=0) in the control group, while the expectation in the test group would be a difference between the pre- and post-test scores (Post$_2$-Pre$_2$≠0). However, before coming to this conclusion, it should be shown that the pre-test scores of both the control and the test group are equal (Pre$_2$-Pre$_1$=0). On the other hand, a significant difference is expected in the post-scores of control and the test group (Erkuş, 2017, p.112).

Participants

The study was conducted in two public middle schools that are socioeconomically mid-level in the city of Aksaray. In determining the schools to conduct the study, socioeconomical aspects were taken into consideration. Based on the information obtained from the Provincial Directorate of National Education, 125.Yıl Middle School and Güller Ceylan Acar middle school were selected as the study sites. A drawing was performed to identify the classes to participate in the study, and the class 5-C in the 125. Yıl middle school was determined to be the test group and the class 5-A in the Güller Ceylan Acar middle school was determined to be the control group.

Data Collection Tools

In developing the scale, the researched consulted with an expert after identifying 10 different types of text in the first phase. Then, one informative, one narrative, and one poetic text were selected among the ten texts to identify the level of comprehension of students.

Multiple data collection tools were used in collecting the data. A reading comprehension scale developed by Yıldırım (2010) was used to measure the effect of the applied program on students' reading comprehension skills. For acquisition of comprehension skills, a 45-item, multiple choice comprehension test was created. The questions were reviewed by two experts in the field. For testing the reliability and validity of the instrument, the questionnaire was randomly distributed to 176 students in 6th grade in two schools with similar characteristics. After the test application, item and test analyses were performed. Based on the results of the analyses, three items were removed. The scale was found to be at a mid-level in term of power (.68) and the correlation coefficient calculated between the two halves of the test (r=.73) showed that the scores obtained from the test are reliable ((Yıldırım, 2010, p.150).

To identify the self-regulating learning skills in the study, the "Motivated Strategies for Learning Questionnaire" developed by Pintrich, Smith, Garcia, & Mckeachie (1991), and adapted to Turkish by Kayıran (2009) was used. The scale consists of two sub-dimensions that are motivation and learning strategies. Motivation sub-scale consists of dimensions of cognitive strategies and cognitive awareness strategies (repetition, detailing, organizing, critical thinking, cognitive awareness self-regulation) and resource management (study time and environment, efforts for organizing, peer collaboration, asking for help). The process of scale adaptation involved working with experts who are fluent in both languages and knowledgeable in both cultures. Expert feedback was sought for the form adapted to Turkish. Experts were asked to respond to the length of items in a 5 point Likert scale with 1 being not at all likely and 5 being extremely likely. Based on the expert feedback, 3 of the items of 50 related to motivation dimension were removed. A pilot questionnaire was developed consisting of 80 items total including 47 items related to motivation. Then, the questionnaire was piloted. The expert feedback and the data obtained from the pilot test, the scale was reviewed. Then, the questionnaire was distributed to 802 students in 5th grade for a reliability and validity test. An exploratory and a confirmatory factor analyses were performed to test the validity of the scale. Two methods were employed in the reliability study. To examine the internal consistency between the scale scores, Cronbach alpha coefficients were calculated. A test-retest method was utilized to test the scale consistency against time. The analyses revealed that the Cronbach alpha internal consistency score was .92 and the test-retest test correlation was .66.

In the current study, "Reading Strategies Cognitive Awareness Scale" developed by Karatay (1992) was used to identify the effect of the tested program on the use of reading strategies. A measurement scale was developed to determine the level of cognitive awareness on planning, organizing, and evaluating the reading process needed to comprehend, critique, and evaluate a text in academic readings. Drawing from resources related to the topic and expert opinions, reading strategies that can be used by students during comprehension process were identified and then these strategies were transformed into a Likert type scale.

After the first intervention, the items that did not load were corrected and a confirmatory factor analysis was completed on the data obtained from 381 elementary, 466 middle, and 491 college students to identify the reliability and validity of the scale. A three dimensional -planning (9 items), organizing (14 items), and evaluating (9 items) reading- scale consisting of 32 items was distributed to students and teachers. The results for internal consistency coefficients revealed that all factors and the sum (.88) of the scale were above .50.

Reading Motivation Scale that was adapted to Turkish and tested for reliability and validity by Yıldız (2010) was used in the study to identify the effect of the intervention program on reading motivation. The Reading Motivation Scale was developed by Wigfield & Guthire (1995, 1997) and re-structured through several analyses over time (Baker & Wigfield, 1999; Wang & Guthire, 2004). The scale which addresses reading motivation from multiple dimensions is one of the most frequently used scales in the literature for reading motivation measurement. Yıldız (2010), in their study, modified the version updated by Wang & Guthire (2004) to include internal and external motivation. The scale is a 4-point Likert scale with 1 being "very different from me", 2 being "different from me", 3 being "similar to me" and 4 being "very similar to me." According to the reliability analyses completed within the scope of modification studies showed the scale's internal consistency coefficient as (α) .86.

Data Analysis

In analyzing the data, first the assumption of normality was checked to decide whether parametric or non-parametric tests should be used. According to the classical test setup to test the hypotheses, the means of test and control groups were compared.

Testing the Assumption of Normality

In order to test the assumption of normality, a Kolmogorov-Smirnov test was completed on all the groups and the results are presented in table 2.

Table 2. Kolmogorov-Smirnov test results

Group	Statistical Test Value	p Value*
Motivation and Learning Pre-test	.093	.200
Motivation and Learning Post-test	.090	.200
Reading Comprehension Pre-test	.125	.039*
Reading Comprehension Post-test	.139	.012*
Reading Motivation Pre-test	.149	.005**
Reading Motivation Post-test	.143	.008**
Reading Strategies Pre-test	.073	.200
Reading Strategies Post-test	.091	.200

*significant at the .05 level ** significant at the .01 level*

According to the results shown in table 2, the pre-test and post-test scores for "Motivation and Learning Scale", and the pre-test and post-test data for "Reading Strategies Scale" are normally distributed (p>.05) while the pre-test and post-test data for "Comprehension Scale" and the re-and post-test data for "Reading Motivation Scale" are not normally distributed (p<.05). According to these results, independent and dependent paired samples t-tests as parametric tests were completed for the Motivation and Reading Strategies data, while Wilcoxon signed rank test was completed on dependent samples, and Mann Whitney U test was completed for independent samples as non-parametric tests on the data for Comprehension and Reading motivation.

Application of Experimental Procedures

This study was conducted in the second semester during the 2018-2019 academic year. The intervention took place as 4 hours a week over 12 weeks. A literature search was completed to frame the study and then the materials were prepared to use in the study. During the process of preparing lesson plans for self-regulation based Turkish courses, first a literature search was completed. When the lesson plans and activities were prepared, they were presented to experts for feedback and necessary changes were made based on the feedback. During the process of lesson plan preparing, phases and processes defined by Zimmerman (2002, p.67) and the self-regulation learning strategies defined by Pintrich (1999, p.460) were used.

The lesson plans were organized in three phases that are; "Forethought Phase", "Performance Phase," and "Self-Reflection" phase in alignment with self-regulating strategies. In the forethought phase, environmental structuring, organization of the physical environment, identifying goals and planning were prioritized. In the performance phase, motivation – self-observation and management strategies were prioritized. Reading strategies to be used during and after reading are identified. In the self-reflection phase, the purpose is to evaluate the text that's read. Students compare the prior knowledge with the new knowledge and evaluate with a critical lens.

During the process of lesson plan creation, the gradual responsibility transfer model was used. First, ways of using learning and reading strategies were taught by the teacher. Then, students engaged in the activities under the supervision of the teacher. The teacher intervened when needed. In the last phase, students made meaning of the text by using these strategies independently.

FINDINGS AND DISCUSSION

1.   When the comprehension pre-test scores were controlled for in the control group and the test group that received self-regulation based learning skills, the test group showed a significant difference in the post-test scores.

Table 3. Wilcoxon signed ranks test results of pre- and post-test for comprehension scale in the control group

Group	N	Mean Ranks	Sum of Ranks	Z	p*
Negative Rank	13	12.19	158.50		
Positive Rank	9	10.50	94.50	-1.04	.297
Equal	4				

*significant at the .05 level ** significant at the .01 level*

According to the results presented in table 3, there was no significant difference between pre-test and post-test scores in the comprehension scale (z=-1.04; p>.05). As there was no intervention in the control group, this was an expected outcome.

Table 4. Mann Whitney U test results of pre-test scores for comprehension scale in the control and test groups

Group	N	Mean Ranks	Sum of Ranks	U	p*
Control	26	23.17	602.50	251.50	.076
Test	27	30.69	828.50		

*significant at the .05 level ** significant at the .01 level*

The results presented in table 4 show that there is no significant difference between the pre-test scores of test and control groups in comprehension (U=251.50; p>.05). In experimental designs, the expectation is that the control and test groups are similar in the beginning in order to observe the

effect of the intervention. According to this, the results of the analysis show that the pre-test scores of control and test groups have similar means.

Table 5. The results of the Wilcoxon Signed Ranks test completed between pre- and post- test scores in the test group for comprehension

Group	N	Rank Means	Sum of Rank	Z	p**
Negative Rank	0	0	0		
Positive Rank	26	13.50	351.00	-4.47	.000
Equal	1				

*significant at the .05 level ** significant at the .01 level*

According to the results presented in table 5, there is a significant difference between the pre- and post-test scores of the test group that received self-regulation based strategic reading education (Z=-4.47; p<.01). This difference is in the post-test scores of the test group. Thus, the self-regulation based strategic reading education in the test group had a positive, significant effect on comprehension scores in the test group.

Table 6. The results of Mann Whitney U Test completed in post-test scores for comprehension in the control and test groups

Group	N	Mean Ranks	Sum of Ranks	U	p**
Control	26	13.60	353.50	2.50	.000
Test	27	39.91	1077.50		

*significant at the .05 level ** significant at the .01 level*

According to the results presented in table 6, there is a significant difference between the post-test scores of control and test groups in comprehension (U=2.50; p<.01). Thus, the intervention applied in the test group resulted in a positive and significant difference compared to the control group. In other words, the self-regulation based strategic reading education is more effective than the current program.

2.   When the pre-test scores for reading strategies cognitive awareness strategies are controlled for in the test group with improved self-regulation based learning skills and the control group that were taught according to the for Turkish Course lesson plan, there was a difference between the post-test scores in the test group.

Table 7. t test results for the control group in reading strategies

Group	N	Mean	Standard Deviation	t	Df	p*
Pre-test	26	105.27	13.35	-1.80	25	.084
Post-test	26	109.50	9.79			

*significant at the .05 level ** significant at the .01 level*

According to the results presented in table 7, there is no significant difference between the pre- and post-test scores in reading strategies for the control group (t=-1.80; p>.05). As there was no intervention in the control group, these results were expected.

Table 8. t test results of pre-test scores between the control and the test group in reading strategies

Group	N	Mean	Standard Deviation	t	Df	p*
Control	26	105.27	13.35	1.58	51	.120
Test	27	98.81	16.18			

*significant at the .05 level ** significant at the .01 level* (Levene's test for homogeneity of variance F=.71; p>.05)

The results seen in table 8 show that there is no significant difference found between the pre-test scores of the control and the test groups in reading strategies (t=1.58; p>.05). In experimental designs, the initial state of control and test groups are expected to be similar in order to observe the effect of the intervention. Within this context, it is seen that the pre-test scores of control and test groups have similar means.

Table 9. t-test results for pre-and post-test scores of the test group in reading strategies

Group	N	Mean	Standard Deviation	t	Df	p**
Pre-test	27	98.81	16.18	-12.99	26	.000
Post-test	27	136.41	8.85			

*significant at the .05 level ** significant at the .01 level*

Table 9 shows that there is a significant difference between the pre- and post-test scores of the test group which received the intervention (t=-12.99; p<.01). This difference lies in the post-test scores and indicates that the intervention had a positive effect on reading strategies.

Table 10. t-test results between post-test scores in the control and test groups of reading strategies

Group	N	Mean	Standard Deviation	t	Df	p**
Control	26	109.50	9.79	-10.50	51	.000
Test	27	136.41	8.85			

*significant at the .05 level ** significant at the .01 level* (Levene's test for homogeneity of variance F=.44; p>.05)

According to the results presented in table 10, there is a significant difference between the post-test scores in the test group for reading strategies (t=-10.50; p<.01). Thus, the intervention affected the test group positively and significantly compared to the control group. In other words, self-regulation based reading education had an effect on the use of reading strategies.

3.   When the pre-test scores in reading motivation for the test and the control group, there was a significant difference in the test group in terms of the post-test scores.

Table 11. Signed Ranks Test results between pre-test and post-test scores in reading motivation in the control group

Group	N	Rank Means	Sum of Ranks	z	p*
Negative Rank	8	9.69	77.50	-1.03	.302
Positive Rank	12	11.04	132.50		
Equal	6				

*significant at the .05 level ** significant at the .01 level*

The results in table 11 show that there is not significant difference between the pre- and post-test scores in reading motivation in the control group (z=-1.03; p>.05). As there was no intervention in the control group, this is an expected result.

Table 12. Mann Whitney U Test results in reading motivation pre-test scores in the control and test groups

Group	N	Rank Means	Sum of Ranks	U	p*
Control	26	28.71	746.50	306.50	.428
Test	27	25.35	684.50		

*significant at the .05 level ** significant at the .01 level*

According to the results presented in table 12, there is no significant difference in pre-test scores between the test and the control groups in reading motivation (U=306.50; p>.05). In experimental designs, the initial state of control and test groups are expected to be similar in order to observe the effect of the intervention. Within this context, it is seen that the pre-test scores of control and test groups have similar means.

Table 13. Signed Ranks Test Results in reading motivation scores between pre-test and post-test scores in the test group

Group	N	Rank Mean	Sum of Rank	Z	p**
Negative Rank	0	0	0		
Positive Rank	27	14.00	378.00	-4.55	.000
Equal	0				

*significant at the .05 level ** significant at the .01 level*

The results in table 13 show that there is a significant difference between the pre- and post-test scores of the test group in self-regulation based reading education (Z=-4.55; p<.01). This difference is in the post-test scores. The intervention on the test group had a positive and significant effect on reading motivation.

Table 14. Mann Whitney U test results in post-test scores of control and test groups in reading motivation

Group	N	Rank Means	Sum of Ranks	U	p**
Control	26	16.40	426.50	75.50	.000
Test	27	37.20	1004.50		

*significant at the .05 level ** significant at the .01 level*

According to the results presented in table 14, there is a significant difference between the post-test scores of the test and the control groups in reading motivation (U=75.50; p<.01). This difference is seen in the test group scores. Based on the results, the intervention in the test group had a positive and significant difference compared to the control group. The program implemented that focused on self-regulation had an impact on the reading motivation of students.

4.   When the pre-test scores for motivation and learning strategies are controlled for, the test group showed a significant difference.

Table 15. t-test results of pre- and post-test scores in motivation and learning strategies for the control group

Group	N	Mean	Standard Deviation	t	df	p*
Pre-test	26	133.04	20.71	-0.680	25	.503
Post-test	26	135.65	17.06			

*significant at the .05 level ** significant at the .01 level*

As seen in table 15, there is no significant difference between the pre- and post-test scores in motivation and learning strategies in the control group (t=-0.680; p>.05). As there was no intervention in the control group, this is an expected result.

Table 16. t-test results of pre-test scores of control and test groups in motivation and learning strategies

Group	N	Mean	Standard Deviation	T	df	p*
Control	26	133.04	20.71	-.825	41.49	.414
Test	27	136.96	12.85			

*significant at the .05 level ** significant at the .01 level* (Levene's test for homogeneity of variance F=6.21; p<.05)

As reported in table 16, there is no significant difference between the pre-test scores of test and control groups in motivation and learning strategies (t=-0.825; p>.05). In experimental designs, the initial state of control and test groups are expected to be similar in order to observe the effect of the intervention. Within this context, it is seen that the pre-test scores of control and test groups have similar means.

Table 17. t-test results for pre- and post-test scores if the test group in motivation and learning strategies

Group	N	Mean	Standard Deviation	t	df	p**
Pre-test	27	136.96	12.85	-15.37	26	.000
Post-test	27	164.15	12.01			

*significant at the .05 level ** significant at the .01 level*

According to the results presented in table 17, there is a significant difference in the post-test scores of the test group (t=-15.37; p<.01). Thus, the intervention resulted in a positive and significant effect on motivation and learning strategies. The program implemented was effective on the self-regulation skills of students.

Table 18. t-test results of post-test scores between the control and test groups in motivation and learning strategies

Group	N	Mean	Standard Deviation	t	df	p**
Control	26	135.65	17.06	-7.05	51	.000
Test	27	164.15	12.01			

*significant at the .05 level ** significant at the .01 level* (Levene's test for homogeneiety of variance F=.89; p>.05)

According to the table 18, there is a significant difference in post-test scores between the control and the test groups in motivation and learning strategies (t=-7.05; p<.01). This difference lies in the scores of the test group. Thus, the intervention done in the test group resulted in a positive and significant difference in comparison to the control group. In other words, self-regulation based reading education is more effective than the current education program.

DISCUSSION AND CONCLUSION

Analyses were completed on the pre- and post-test scores of the findings and the results for each hypothesis are as follows:

1.   No significant difference was found between the pre- and post-test scores of the control groups as expected.

2.   No significant difference was found between the pre-test scores of the control and test groups. In experimental designs, both groups are expected to be similar initially in order to observe the effect of the intervention. This condition was met.

3.   Significant differences in the post-test scores were found between the test group's pre- and post-test scores as a result of the self-regulation based strategic reading education. This program resulted in a positive and meaningful effect in the test groups which is shown in figure 1.
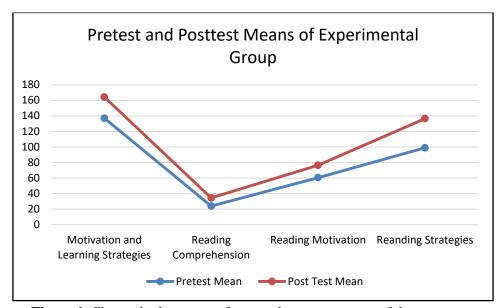

Figure 1. Change in the means of pre- and post-test scores of the test group

According to figure 1, the post-test scores are higher than the pre-test scores in the test group.

4.   There was a significant difference in the post-test scores of the test group. This is a desired outcome of the intervention in experimental studies. This is shown in figure 2.
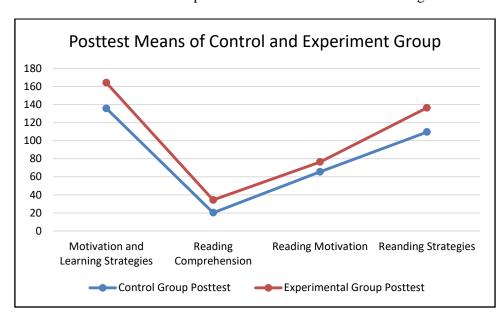

Figure 2. Change in the means of post-test scores of the control and test groups

Figure 2 shows that the post-test mean scores in the test group are higher than the control group. The findings show that the self-regulation based reading strategy education had a positive and significant effect on 5th grade students' comprehension, reading strategies, reading motivation and self-regulation skills. The literature shows that self-regulated learning strategies have an effect on academic success (Ataş, 2009; Camahalan, 2006; Eker, 2012; Gülay, 2012; İsrael, 2007; Kayıran, 2014; Müldür, 2017; Souvignier & Mokhlesgerami, 2006; Oruç, 2012; Tolaman, 2017; Tracy, Reid & Graham, 2009; Uyar, 2015; Uygun, 2012; Zubrunn & Bruning, 2013). Some of these studies focus on improving reading skills. In their study, Oruç (2012) investigated the effects of self-regulated learning on comprehension skills in Turkish courses, attitudes towards this course, and the meta-cognitive thinking skills. It was found that the self-regulated learning improved students' comprehension and meta-cognitive thinking skills. These findings are compatible with the findings of the current study. Kayiran (2014) conducted a study on 5th grade students and found that self-regulated learning model impacts comprehension skills. The intervention had effects on cognitive awareness-learning strategies, self-efficacy, time and study environment management, and task value while it did not have any effects on test anxiety, and asking for help. These findings are compatible with the findings of the current study. Uyar (2015) conducted a study with 5th and 8th grade students focusing on improving their self-regulation based reading skills and identifying the effects of improvements on comprehension. After the intervention, a significant increase in comprehension levels of students was found in the test group while no change was found in the control groups.

Studies show that improvement of self-regulated learning skills has an effect on academic success. These studies emphasize that teachers play an important role in improving self-regulation strategies and learner-centered education styles impact academic success, self-regulation, and motivation positively. In the current study, a gradual responsibility transfer model in teaching self-regulated learning strategies and reading strategies was used. Students learned how to use strategies with the guidance of their teachers and tried to reach to the level of independent user.

Recommendations

1. To improve students' reading, the use of cognitive and meta-cognitive strategies, and self-regulation strategies should be conveyed within the frame of gradual responsibility transfer model.

2. Students' self-regulation based reading skills should be supported in the classroom.

3. In order to develop positive attitudes in students for classes taught with self-regulated learning, self-regulated learning strategies should be used in a more effective, fun, and attention drawing way.

4. Turkish Course Education Program should be developed through structuring it within the frame of self-regulation learning model.

5. Teachers should be trained on how to teach self-regulation based strategies through in-service workshops.

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