

# The Effect of Self-Regulation-Based Teaching on the Development of Pre- Service Teachers' Reading and Writing Skills in English

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## Abstract

The aim of this study was to examine the effects of teaching based on self-regulation strategies on pre-service English language teachers' achievement in the Advanced Reading and Writing I course, use of self-regulation strategies, reading anxiety, attitudes towards reading, writing anxiety, attitudes towards writing, and self-efficacy beliefs. The study employed a quasi-experimental design with a paired pretest-posttest control group. Quantitative data were collected by using measurement tools related to pre-service teachers' achievements, levels of self-regulation strategies, anxiety levels, attitudes, and self-efficacy beliefs before and after the application. According to the findings obtained as a result of the analysis, the achievement scores of the experimental group pre-service teachers are higher than those of the control group. In addition, it was observed that the experimental group pre-service teachers incorporated several self-regulation strategies into their learning process. In the measurement of pre-service teachers' reading and writing anxieties, it was determined that the experimental group pre-service teachers' anxiety levels were higher. It was figured that both groups had high self-efficacy perceptions and showed significant attitudes toward reading and writing skills.

**Keywords:** self-regulation strategies, self-efficacy, anxiety, attitude, English achievement.

## Öğretmen Adaylarının İngilizce Okuma ve Yazma Becerilerinin Geliştirilmesinde Öz Düzenlemeye Dayalı Öğretimin Etkisi

### Öz

Bu çalışmada öz düzenleme stratejilerine dayalı öğretimin İngilizce öğretmen adaylarının İleri Okuma Yazma I dersi başarılarına, öz düzenleme stratejileri kullanımlarına, okuma kaygılarına, okumaya yönelik tutumlarına, yazma kaygılarına, yazmaya yönelik tutumlarına ve öz yeterlik inançlarına olan etkisi incelenmiştir. Karma yöntem kullanılan çalışmanın nicel bölümünde yarı deneysel desen türlerinden ön test-son test eşleştirilmiş kontrol gruplu desen kullanılmış, nitel bölümünde ise odak grup görüşmesi yapılmıştır. Öğretmen adaylarının başarıları, öz düzenleme stratejileri düzeyleri, kaygı düzeyleri, tutumları ve öz yeterlik inançlarına ilişkin ölçme araçları uygulama öncesi ve sonrasında kullanılarak nicel veriler toplanmıştır. Nitel boyutta, deney grubu ile uygulama sürecine dair yarı yapılandırılmış görüşme sorularının kullanıldığı odak grup görüşmesi gerçekleştirilmiştir. Analiz sonucunda edinilen bulgulara göre deney grubu öğretmen adaylarının başarı puanları kontrol grubundan daha yüksektir. Ayrıca deney grubu öğretmen adaylarının öz düzenleme stratejilerini öğrenme süreçlerine dahil ettikleri görülmüştür. Öğretmen adaylarının okuma kaygıları ile yazma kaygıları ölçümlerinde deney grubu öğretmen adaylarının kaygı düzeylerinin daha yüksek olduğu saptanmıştır. Her iki grubun da öz yeterlik algılarının yüksek olduğu ve okuma yazma becerilerine yönelik önemli tutum sergiledikleri tespit edilmiştir.

**Anahtar kelimeler:** öz düzenleme stratejileri, öz yeterlik, kaygı, tutum, İngilizce başarı.

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## INTRODUCTION

Moving away from the teacher-centered and behavioral approach in learning and teaching environments, a learner-centered education approach was adopted beginning in the second half of the 1900s. Followingly, the role of teachers in the educational environment has changed and teachers have become a figure that teaches, guide and facilitates access to information rather than being a point of transferring information. The aim of education is not to raise individuals who know a lot but to raise individuals who know how to access information and who can use this information effectively in their lives, question, think, and analyze (Çalık & Sezgin, 2005). In addition, technological developments, the change in the perspective towards education, the facts that individual developments can be studied better, and the importance of cognitive processes are more clearly understood indicate that the development of individuals continues throughout their lives; hence, the education and learning process is not limited to school only and it is proved to be in every moment of life (Oğuz, Oktay & Ayhan, 2010). However, in the education and training process, the existence of programs prepared with the 21st-century educational approach and the presentation of effective educational experiences based on these programs are not sufficient on their own for the effective realization of the learning function (Cabı & Yalın, 2011). Among the factors that affect the fulfillment of this function, and therefore the learning of students and their academic success, there are many variables such as their motivation, their willingness, and their high self-awareness (Dörnyei, 2003). For this purpose, individuals should be given the skills of being conscious of their own learning and knowing how to learn and how to structure what they have learned in the education and training processes (Guvenc, 2010). In other words, students should know where, how, for what, when, and why he/she should use active learning strategies and should be able to make their learning permanent with the strategies he/she creates (Çiltaş, 2011). In brief, active individuals in the learning environment should be able to draw their paths instead of choosing the paths presented to them to achieve their goals.

In education systems, individuals who set goals for their own learning, act cognitively and behaviorally in line with these goals, manage their own motivation, and evaluate themselves lead to the emergence of self-regulated learning strategies (Dewe, O'Driscoll, & Cooper, 2012). According to Eker (2014), using self-regulated learning strategies the individuals set their goals, are aware of what these goals will bring them, and know that if they adopt the goals, they will be more successful. Self-regulated learning requires the individual to be active in all aspects of the learning process. It creates a student-centered learning environment by enabling students to research, question, examine, and actively participate in the learning process (Güneş, 2014). Self-regulation, which is a learning approach, can also be seen as a prerequisite for other learning methods. Students who take responsibility for their own learning organize their own learning process at all stages, starting from the goal-setting stage to the evaluation stage.

Zimmerman, Bonner, and Kovach (1996) stated that if students use self-regulation strategies to make their learning effective, all students will achieve success. According to Bandura's socio-cognitive theory, self-regulation skills, along with self-efficacy belief, are the main factors that play a role in the learning process and success (Schunk & Zimmerman, 2007). In its most basic definition, learning based on self-regulation strategies can be expressed as the individual's activating, managing, and maintaining his/her effort toward learning (Zimmerman, 1995). This cycle aims not only to make students learn better but also to increase their self-efficacy perceptions and their effects on learning processes (Zimmerman et al., 1996). Students with self-regulation skills approach assigned tasks with confidence, effort, and mastery. They are aware of their knowledge and skills and know when they have the necessary equipment and when they do not. Despite the problems they encounter in their learning processes, they can be successful as well as being able to reach the information they need and learn fully (Zimmerman, 1990a).

It can be interpreted that the 21st century educational goals and student profile as expressed by Trilling and Fadel (2009) coincide with self-regulation skills, and therefore having these skills is a must for learners who do not lag behind the times and have the necessary qualifications of the time they live in. In addition, it has been stated that these skills that individuals have in their education life are also effective in lifelong learning processes (Bolhuis, 2003; Garrison, 1997; Lüftenegger, Schober, Van de Shoot, Wagner, Finsterwald, & Spiel, 2012). Since learning takes place in all phases of life, it is possible to say that learners should be able to organize their own learning experiences and self-disciplines without needing any guidance inside and outside the school (Hooley, 2014). For this reason, it is among the behaviors expected from today's learners to ensure work discipline, to identify good and deficient points, to be aware of their abilities and potential, and to maintain this throughout their

lives. Therefore, the ability of learning to learn has become the primary goal at every stage of education life (Visser & Visser-Valfrey, 2008).

According to the aforementioned educational goals and student profile, the concept of learning is not limited to the formal education process. Therefore, individuals should be taught how to acquire knowledge, how to incorporate appropriate learning strategies into their lives, and how to organize their learning experiences rather than reaching knowledge directly (Chen, 2007). The inclusion of these skills in education programs will truly improve the learning experiences of society and the concept of lifelong learning will be supported (Cornford, 2002) as self-regulated learning strategies begin to develop at a very young age and are developed at every learning level and every lesson, enabling students to become lifelong learners (De Corte, 2019; Taranto & Buchanan, 2020).

On the other hand, many national studies have shown that self-regulation strategies are an effective variable on academic achievement (Karabacak, 2014; Kılıç, 2016; Kuyumcu Vardar, 2011; Özbay, 2008; Süer, 2014; Vural, 2013). It is possible to conclude from these studies that the use of self-regulation strategies has a positive effect on academic achievement. In addition, studies on self-regulation have revealed that students with low achievement use learning strategies less (Altun, 2005; Barker & Olson, 1995; Gülşen, 2000; Paterson, 1996; Langley, Wanbach, Brothen, & Madyun, 2004; Vandertoep, Pintrich and Fagerlin, 1996). In this context, there are also studies showing that the level of foreign language success and self-regulation skills affect each other positively (Dörnyei, 2003; Zimmerman, Bandura, & Martinez-Pons, 1992). Likewise, the lack of self-regulation strategies can be considered as one of the reasons for the low academic success in English.

Studies by Oxford (1990) have revealed the effectiveness of different learning strategies in improving language skills (as cited in Zhang, 2008). Self-regulated learning strategies, on the other hand, have become an important research area in education and psychology in the recent decades. However, it has been studied relatively recently in the field of foreign language learning (Collett, 2014). When self-regulated learning is examined in terms of the foreign language learning process, self-regulated learning strategies are defined as intentional, goal-oriented attempts to control and manage the foreign language learning process (Oxford, 2011). These strategies are teachable actions that foreign language learners choose from among various options and use to support their learning goals. At this point where the concept of a student who can control the learning process and be autonomous in learning has emerged, incorporating self-regulation skills into the foreign language learning process will enable students to cope with language learning challenges more easily. (Zimmerman, 1990b). As stated by Nakata (2010), teachers do not know how to include self-regulated learning strategies in the foreign language learning process and how to bring their students to this point. It can be stated that these practices are ignored, especially at the university level, and most of the foreign language students who are studying do not have enough information about their own learning strategies (Zaimoğlu & Şahinkarakaş, 2019). In addition to their teaching skills, foreign language pre-service teachers and teachers continue their foreign language learning processes, and their experiences in this process shape their future teaching lives (Köksal & Dündar, 2017). Therefore, raising pre-service teachers' awareness of self-regulation strategies will have a positive effect on both their own learning experiences and the foreign language learning processes of their future students.

The starting point of this study was the idea that students should be aware of self-regulation strategies and that teachers should guide students at this point, to improve the lives of individuals outside of educational institutions, as well as to support academic success. Enabling individuals to be aware of their learning processes by including self-regulation strategies in education programs is an expected goal of educators (Serçe & Sünbül, 2015). Thus, the idea that pre-service teachers should be aware of self-regulation strategies before starting the teaching profession and that they should be able to use these strategies should be included in the education faculty programs is based on this study.

It cannot be denied that teachers have a significant impact on the process of gaining self-regulation strategies. However, while there are studies that reveal the relationship between literacy skills and self-regulation skills of both children and adults learning a foreign language, the number of studies involving pre-service teachers who will teach this language is much less (Perry, Hutchinson, & Thauberger, 2007). Similarly, the fact that no studies have been found in Türkiye revealing the relationship between pre-service teachers' anxiety, attitudes, self-efficacy beliefs, self-regulation strategies, and achievements towards literacy skills has led to this study. In contrast, pre-service teachers' elimination of their anxiety about the language they will teach and developing a positive attitude may enable them to help and guide their students in the coming years. Thus, based on the foresight that literacy skills, which are an important part of academic, daily, and business life, can be developed more effectively, the problem statement of the research is formed as follows:

When the pre-test scores of English pre-service teachers in the experimental and control groups were controlled, is there a significant difference between self-regulation strategies, reading anxiety, writing anxiety, attitudes towards reading, attitudes towards writing, self-efficacy beliefs, and achievement test post-test scores?

## METHOD

In this quantitative research, the matching-only pretest-posttest control group design, which is one of the quasi-experimental design types, was utilized. Quasi-experimental designs differ from experimental designs in that they do not include random assignments, and they are frequently preferred in social sciences. These designs are used when the controls required by the experimental designs are not provided or are not sufficient (Karasar, 2014). Two of the ready-made groups are used in the matching-only design. The fact that the groups are ready here creates the difference in design from experimental designs. Two different groups studying in the 1st year of the English Language Teaching program of the university where the study was conducted in the 2017-2018 academic year were included in the study. Pre-service teachers were not assigned to these groups by the researcher before the application, and the existing groups were assigned as experimental and control groups randomly.

In the research, the effect of teaching using self-regulation strategies on the attitudes and anxieties towards reading and writing skills, self-regulation strategies, foreign language self-efficacy perceptions, and achievements of pre-service English teachers within the scope of Advanced Reading and Writing I course in the fall semester of the 1st year of the Department of English Language Teaching was examined. Attitudes and anxieties of pre-service teachers towards reading and writing skills, use of self-regulation strategies, foreign language self-efficacy perceptions, and achievements were the dependent variables of the research. The teaching activities of the Advanced Reading and Writing I course designed by the researcher using self-regulation strategies are the independent variable whose effect on the dependent variable was tested.

### Study Group

The research group consisted of pre-service teachers studying at the Department of English Language Teaching at the Faculty of Education of a state university located in the Western Black Sea Region. Two groups of pre-service teachers who completed foreign language preparatory education in the 2016-2017 academic year or who received a passing grade in the foreign language proficiency exam held at the beginning of the 2017-2018 academic year and continued the first semester of their undergraduate education were included in the study. The groups were randomly assigned as experimental and control groups.

There were 30 pre-service teachers in the experimental group and 26 pre-service teachers in the control group. Out of a total of 56 pre-service teachers, 41 were girls and 15 were boys. In determining the number of pre-service teachers in the groups, their participation in the entire research process was taken into consideration. The data collected from the pre-service teachers who took part in all stages from the pre-test to the post-test were included in the study.

### Data Collection Tools

Quantitative data collection tools were used in this study, which examines the effects of teaching activities based on self-regulation strategies on pre-service teachers' concerns and attitudes towards reading and writing skills, use of self-regulation strategies, self-efficacy beliefs, and academic achievements. In the study, "Foreign Language Reading Anxiety Scale" (Saito, Garza and Horwitz, 1999. Adapted by Kuru Gönen, 2005), "Attitudes Towards Reading English Scale" (Tezdiker, 2007), "Second Language Writing Anxiety Inventory" (Cheng, 2004. Adapted by Ateş, 2013), "Attitude Towards Writing in English Questionnaire" (Bayram, 2006), "English Self-Efficacy Perception Scale" (Hancı Yanar, 2008), "Motivation and Learning Strategies Scale" (Pintrich, Smith, Garcia and McKeachie, 1991. Adapted by Büyüköztürk, Akgün, Özkahveci and Demirel, 2004) and an achievement test developed by the researcher were used. In the selection of the scales, the characteristics of the sample and study groups in which the scales were developed, applied, and translated into Turkish were considered, as well as the characteristics of the group to be included in the study. Utmost care was taken to ensure that these measurement tools, which have been included in the literature by testing their validity and reliability, are chronologically recent to this study.

The reliability coefficient of the measurement tools was measured using the Cronbach alpha ( $\alpha$ ) coefficient. A scale can be regarded reliable if the Cronbach alpha ( $\alpha$ ) reliability coefficient calculated in psychological tests is higher than .70 (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz and Demirel, 2014). As a result of the analysis of the data, it was observed that the reliability coefficients obtained from the measurement tools were in this range, which was interpreted as high internal consistency between the test scores and was included in the study.

In addition to these tools, an achievement test was developed to measure the success of pre-service teachers in the Advanced Reading and Writing I course. The reading section consists of four sections that include reading comprehension and vocabulary. Questions for reading comprehension include effective reading strategies such as skimming and scanning and creating a chart to summarize a text. In the part prepared to measure the vocabulary, they were asked to guess the meanings of the words in the piece and to indicate the clues they used in these predictions (guessing from context). As for the writing section of the test, since reading and writing skills are tested together in the content of the exam, it was thought that asking them to write a full essay would not be useful in terms of the time and validity of the test. This section, which is organized over 50 points in line with the objectives of the course and in parallel with the reading section, consists of parts which are analyzing a well-written essay, creating an outline on the given topic, and writing the introductory paragraph of an essay. The ESL Composition Profile scale (Hughey, 1983) was used to evaluate the paragraph section.

### Implementation Process

According to the developed program, the first two weeks of the academic term, which lasted for 14 weeks, were devoted to informing students about the content and process of the course. In addition, the second week was spared to convey basic information about writing texts and to give preliminary information about reading strategies in general. In this way, pre-information about the content of the course was given to the pre-service teachers and it was aimed to increase their readiness level. From the third week of the term, teaching activities prepared in accordance with self-regulation strategies were put into practice. In the following weeks, three classes had to be skipped for exam weeks and course evaluation week. The remaining 9 weeks are reserved for course activities prepared for the development of reading and writing skills.

### Data Collection Process

Before the implementation of the program, the experimental and control groups were given instructions containing information about the purpose, scope, process, and effects of the study, and they were asked to participate in the study. Only volunteer pre-service teachers were included in the study. After the necessary explanations were made, the achievement test was applied to both groups in the first week of the fall semester. As a continuation of the pre-test studies, the measurement tools used in the study were applied to both groups in the same week. Due to the large number of measurement tools, care was taken not to apply all of them at the same time and different course hours were used for this task. Post-test applications were carried out in the same procedure in the 14th week of the semester.

### Data Analysis

In order to determine whether there is a significant difference between the self-regulation strategies, reading anxiety, writing anxiety, reading attitudes, writing attitudes, self-efficacy beliefs, and achievement levels post-test scores of the pre-service teachers in the experimental and control groups, it was deemed appropriate to control the pre-test scores and it was decided to perform covariance analysis. ANCOVA analysis method was used to compare the post-test scores of the experimental and control groups.

## FINDINGS

Covariance analysis was applied to determine whether there was a statistically significant difference between the post-test scores of the pre-service teachers in the experimental and control groups when the achievement test pre-test scores of the Advanced Reading and Writing I course were controlled. The descriptive statistics of the post-tests are given in Table 1:

Table 1. Descriptive Statistics on the Advanced Reading and Writing I Course Achievement Test Post-Test Scores

	Group	N	$\bar{x} \pm sd$
Achievement post-test	Experimental group	30	83.60±16.03
	Control group	26	61.26±19.36

It was observed that the pre-service teachers in the experimental group had higher achievement test scores for the Advanced Literacy I course than those in the control group. The ANCOVA results applied to determine whether the difference in scores between the groups is significant are presented in Table 2:

Table 2. ANCOVA Results for Advanced Reading and Writing I Course Achievement Test Post-Test Scores

Source of variance	Sum of squares	df	Mean square	F	p
Pre-test	1582.23	1	1582.23	5.33	.023
Group	1346.56	1	1346.56	4.54	.038
Error	15418.61	52	296.51		
Total	324109	56			

According to ANCOVA results, it is seen that there is a statistically significant difference between the post-test scores adjusted according to the pre-test scores of the groups ( $F_{1-53} = 4.54$ ;  $p = 0.038$ ). The achievement test scores of the pre-service teachers in the experimental group were found to be significantly higher than those in the control group.

Covariance analysis was applied to determine whether there was a statistically significant difference between the post-test scores of the pre-service teachers in the experimental and control groups when the pre-test scores of the Motivation and Learning Strategies Scale learning strategies dimension were controlled. The descriptive statistics of the post-tests before the analysis of covariance are given in Table 3:

Table 3. Descriptive Statistics on the Motivation and Learning Strategies Scale Learning Strategies Dimension

	Group	N	$\bar{x} \pm sd$
Learning strategies post-test	Experimental group	30	4.90 $\pm$ 0.53
	Control group	26	4.41 $\pm$ 0.68

Table 3 shows the average scores obtained by the experimental and control groups from the learning strategies dimension. It was observed that the learning strategies post-test scores of the pre-service teachers in the experimental group were higher than those in the control group. The ANCOVA results applied to determine whether the difference in scores between the groups is significant are presented in Table 4:

Table 4. ANCOVA Results for the Post-Test Scores of Motivation and Learning Strategies Scale Learning Strategies Dimension

Source of variance	Sum of squares	df	Mean square	F	p
Pre-test	0.158	1	0.158	0.422	0.519
Group	3.182	1	3.182	8.490	0.005
Error	19.861	53	0.375		
Total	1246.271	56			

Table 4 shows that there is a statistically significant difference between the post-test scores adjusted according to the pre-test scores of the groups according to the ANCOVA results ( $F_{1-53} = 8.490$ ;  $p = 0.005$ ). The learning strategies levels of the experimental group were found to be significantly higher.

Table 5. Descriptive Statistics on the Motivation and Learning Strategies Scale Motivation Dimension

	Group	N	$\bar{x} \pm sd$
Motivation post-test	Experimental group	30	5.10 $\pm$ 0.56
	Control group	26	4.57 $\pm$ 0.81

Table 5 shows the average scores obtained by the experimental and control groups from the motivation dimension of the Motivation and Learning Strategies Scale. It was observed that the motivation post-test scores of the pre-service teachers in the experimental group were higher than those in the control group. The ANCOVA results applied to determine whether the difference in scores between the groups is significant are presented in Table 6:

Table 6. ANCOVA Results for the Post-Test Scores of Motivation and Learning Strategies Scale Motivation Dimension

Source of variance	Sum of squares	df	Mean square	F	p
Pre-test	0.113	1	0.113	0.231	0.633
Group	3.981	1	3.981	8.147	0.006
Error	25.897	53	0.489		

Total	1353.337	56
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In Table 6, it is seen that there is a statistically significant difference between the post-test scores adjusted according to the pre-test scores of the groups according to the ANCOVA results ( $F_{1-53} = 8.147$ ;  $p = 0.006$ ). The levels of motivational strategies of the pre-service teachers in the experimental group were found to be significantly higher.

Covariance analysis was applied to determine whether there was a statistically significant difference between the post-test scores of the pre-service teachers in the experimental and control groups when the pre-test scores of the English Self-Efficacy Scale were controlled. The descriptive statistics of the post-tests before the analysis of covariance are given in Table 7:

Table 7. Descriptive Statistics on the English Self-Efficacy Scale

	Group	N	$\bar{x} \pm sd$
Self-efficacy post-test	Experimental group	30	3.83 $\pm$ 0.35
	Control group	26	3.66 $\pm$ 0.55

Table 7 shows the average scores obtained by the pre-service teachers in the experimental and control groups from the self-efficacy scale. It was observed that the self-efficacy scores of the experimental group were higher than the control group. The ANCOVA results applied to determine whether the difference in scores between the groups is significant are presented in Table 8:

Table 8. ANCOVA Results for the Post-Test Scores of the English Self-Efficacy Scale

Source of variance	Sum of squares	df	Mean square	F	p
Pre-test	0.046	1	0.046	0.211	0.648
Group	0.427	1	0.427	1.970	0.166
Error	11.483	53	0.217		
Total	802.891	56			

Table 8 shows that there is no statistically significant difference between the post-test scores adjusted according to the pre-test scores of the groups according to the ANCOVA results ( $F_{1-53} = 1.970$ ;  $p = 0.166$ ).

Covariance analysis was applied to determine whether there was a statistically significant difference between the post-test scores of the pre-service teachers in the experimental and control groups when the pre-test scores of the Foreign Language Reading Anxiety Scale were controlled. The descriptive statistics of the post-tests before the analysis of covariance are given in Table 9:

Table 9. Descriptive Statistics on the Foreign Language Reading Anxiety Scale

	Group	N	$\bar{x} \pm sd$
Reading anxiety post-test	Experimental group	30	2.74 $\pm$ 0.30
	Control group	26	2.46 $\pm$ 0.33

Table 9 shows the average scores of the pre-service teachers in the experimental and control groups for reading anxiety. Accordingly, it is possible to say that both groups had low levels of reading anxiety. However, it was observed that the reading anxiety scores of the pre-service teachers in the experimental group were higher than those in the control group. The ANCOVA results applied to determine whether the difference in scores between the groups is significant are presented in Table 10:

Table 10. ANCOVA Results for the Post-Test Scores of Foreign Language Reading Anxiety Scale

Source of variance	Sum of squares	df	Mean square	F	p
Pre-test	0.114	1	0.114	1.116	0.296
Group	0.959	1	0.959	9.431	0.003
Error	5.391	53	0.102		
Total	389.549	56			

According to the ANCOVA results, there was a statistically significant difference between the post-test scores adjusted according to the pre-test scores of the groups ( $F_{1-53} = 9.431$ ;  $p = 0.003$ ). The reading anxiety levels of the pre-service teachers in the experimental group were found to be significantly higher than those in the control group.

Covariance analysis was applied to determine whether there was a statistically significant difference between the post-test scores of the pre-service teachers in the experimental and control groups when the pre-test scores of the Attitudes Towards Reading English Scale were controlled. The descriptive statistics of the post-tests before the analysis of covariance are given in Table 11:

Table 11. Descriptive Statistics on the Attitudes Towards Reading English Scale

	Group	N	$\bar{x}\pm sd$
Attitude towards reading post-test	Experimental group	30	3.62±0.32
	Control group	26	3.50±0.28

Table 11 shows the average scores obtained by the pre-service teachers in the experimental and control groups from the Attitudes Towards Reading English Scale. Accordingly, it is possible to say that the attitudes of both groups towards reading are positive. However, the pre-service teachers' reading attitude scores in the experimental group were observed to be higher than those in the control group. The ANCOVA results applied to determine whether the difference in scores between the groups is significant are presented in Table 12:

Table 12. ANCOVA Results for the Post-Test Scores of Attitudes Towards Reading English Scale

Source of variance	Sum of squares	df	Mean square	F	p
Pre-test	0.116	1	0.116	1.234	0.272
Group	0.183	1	0.183	1.953	0.168
Error	4.973	53	0.094		
Total	717.421	56			

According to ANCOVA results, it is seen that there was no statistically significant difference between the post-test scores adjusted according to the pre-test scores of the groups ( $F_{1-53} = 1.953$ ;  $p = 0.168$ ).

Covariance analysis was applied to determine whether there was a statistically significant difference between the post-test scores of the pre-service teachers in the experimental and control groups when the pre-test scores of the Second Language Writing Anxiety Inventory were controlled. The descriptive statistics of the post-tests before the analysis of covariance are given in Table 13:

Table 13. Descriptive Statistics on the Second Language Writing Anxiety Inventory

	Group	N	$\bar{x}\pm sd$
Writing anxiety post-test	Experimental group	30	2.90±0.36
	Control group	26	2.64±0.44

Table 13 shows the average scores of the pre-service teachers in the experimental and control groups for writing anxiety. Accordingly, it is possible to say that both groups had low levels of writing anxiety. However, it was observed that the writing anxiety scores of the pre-service teachers in the experimental group were higher than those in the control group. The ANCOVA results applied to determine whether the difference in scores between the groups is significant are presented in Table 14:

Table 14. ANCOVA Results for the Post-Test Scores of Second Language Writing Anxiety Inventory

Source of variance	Sum of squares	df	Mean square	F	p
Pre-test	0.062	1	0.062	0.379	0.541
Group	0.924	1	0.924	5.614	0.021
Error	8.720	53	0.165		
Total	444.002	56			

According to ANCOVA results, it is seen that there was a statistically significant difference between the post-test scores adjusted according to the pre-test scores of the groups ( $F_{1-53} = 5.614$ ;  $p = 0.021$ ).

Covariance analysis was applied to determine whether there was a statistically significant difference between the post-test scores of the pre-service teachers in the experimental and control groups when the pre-test scores of Attitudes Towards Writing in English Questionnaire were controlled. The descriptive statistics of the post-tests before the analysis of covariance are given in Table 15:

Table 15. Descriptive Statistics on the Attitudes Towards Writing in English Questionnaire

	Group	N	$\bar{x}\pm sd$
Attitudes toward writing post-test	Experimental group	30	3.61±0.45
	Control group	26	3.55±0.41

Table 15 shows the average scores obtained by the pre-service teachers in the experimental and control groups from the Attitudes Towards Writing in English Questionnaire. Accordingly, it is possible to say that the attitudes of both groups towards writing are positive. However, the pre-service teachers' writing attitude scores in the experimental group were observed to be higher than those in the control group. The ANCOVA results applied to determine whether the difference in scores between the groups is significant are presented in Table 16:

Table 16. ANCOVA Results for the Post-Test Scores of Attitudes Towards Writing in English Questionnaire

Source of variance	Sum of squares	df	Mean square	F	p
Pre-test	0.169	1	0.169	0.889	0.350
Group	0.037	1	0.037	0.197	0.659
Error	10.074	53	0.190		
Total	444.002	56			

Table 16 shows that there was no statistically significant difference between the post-test scores adjusted for the pre-test scores of the groups according to the ANCOVA results ( $F_{1-53} = 0.197$ ;  $p = 0.659$ ).

## DISCUSSION & CONCLUSION

In the study, the pretest-posttest scores of the experimental and control group pre-service teachers were compared between the groups. The achievement test scores of the pre-service teachers in the experimental group were found to be significantly higher than those in the control group. Many studies support this finding of the study. Haşlaman and Aşkar (2007) reported that the use of strategy affected the success variable positively and at a high level. In the study conducted by Kuyumcu Vardar (2011), it was reported that the success of the experimental group was significantly higher than the control group as a result of the English language teaching using self-regulation strategies. In the study conducted by Sun and Wang (2020), one of the current studies, it was stated that self-regulation strategies increased the writing success of university students, while Abbasian and Hartoonian (2014) argued that these strategies should be included in the education processes. Pintrich and De Groot (1990), who examined the relationship between students' success, motivational tendencies, and self-regulated learning strategies, stated that self-regulation strategies had a great effect on success. Students' strategy use, self-regulation skills, and motivation levels are variables that directly affect their academic success (Paterson, 1996; Pekrun, Goetz, Titz, and Perry, 2002). In this study, it is seen that the teaching activities in the experimental group in which self-regulation strategies were applied had a positive effect on success. As a result, the findings obtained from the study are similar to the studies in the literature.

The levels of motivation and learning strategies of the pre-service teachers in the experimental group were found to be significantly higher. Looking at the literature, similar findings can be found in experimental studies on this subject. Paterson (1996) found that the experimental group used strategies more in terms of self-regulated learning strategies. In the study conducted by Koç and Erkensiz (2009), it was determined that the self-regulation skills of the students in the experimental group were higher than those of the control group. It was reported by Aarsal (2010) that in the experimental group using self-regulation strategies, internal motivation, the knowledge of cognition, and the use of time and work environment management strategies were significantly higher than the control group. Uygun (2012) stated that there was a statistically significant difference in favor of the experimental group regarding the attitudes towards writing, written expression, and self-regulation skills in writing of the students in the experimental and control groups. Varier, Zumburn, Conklin, Marrs, Stringer, and Furman (2020) stated that successful students use self-regulation strategies more than giving up in the face of challenging tasks. In this study, it can be said that pre-service teachers who showed higher performance in the achievement test used self-regulation strategies more. Due to the content of the Advanced Reading and Writing, I course and the selected course material, cognitive, affective, and metacognitive self-regulation strategies were also included in the control group throughout the teaching process. In the experimental group, in addition to these strategies and unlike the control group, value, expectation, and resource management strategies were used intensively and repeatedly. Therefore, it is possible to conclude that the self-regulatory teaching activities applied in the experimental group increased the strategy use of pre-service teachers.

In this study, in which the self-efficacy perceptions of teacher candidates were examined in terms of their English reading and writing skills, it was seen that their self-efficacy beliefs were moderate in the pre-test and post-test, and there was no significant difference in the measurements between the groups. In the experimental group, unlike the control group, pre-service teachers were asked to set goals before the lesson and evaluate their self-efficacy perceptions accordingly. After the lesson, they again evaluated their self-efficacy perceptions, considering the level of reaching the goals they had determined. However, it was seen at the end of the

implementation that the evaluations of the pre-service teachers regarding their self-efficacy perceptions did not change. Memduhoğlu and Çelik (2015), who obtained a similar result in their studies, stated that the students who were placed in the university with a foreign language score and who received education in a foreign language had more language accumulation. Thus, it can be considered as a normal result that teacher candidates' self-efficacy beliefs are not low. İlbeği and Çeliköz (2020), who revealed that university students who studied in preparatory classes have higher self-efficacy beliefs in English reading skills than other skills, attributed this to the fact that students are more exposed to reading skills in various courses and therefore they see themselves as more competent. Similarly, Unur (2018) stated that university students who took preparatory education and spent more time in foreign languages in their previous lives had higher self-efficacy beliefs. Based on these results in the literature, it is possible to say that the findings obtained in the study are supported. The fact that no significant difference was observed in the self-efficacy beliefs of pre-service teachers before and after teaching based on self-regulation strategies is due to variables different from the implemented teaching activities.

While reading and writing skills show similar developmental processes, they can affect each other positively or negatively during the development process (Karakaya & Ülper, 2011). When the measurement of attitudes towards reading, reading anxiety, attitudes towards writing, and writing anxiety of the experimental and control groups were examined, it was seen that similar results were obtained. Experimental and control group pre-service teachers had low both reading and writing anxiety. Nevertheless, the anxiety level of the experimental group was significantly higher. When the attitude measurements towards reading and writing skills were examined, there was no significant difference, while the experimental group showed a more positive attitude at an insignificant level for both skills. As a result, it can be said that the experimental group had a higher level of anxiety and displayed a more positive attitude. During the implementation, it was aimed to provide a positive attitude towards these skills through self-regulated teaching activities prepared in the experimental group. Points such as how they could use the information they learned in their academic, professional, and personal lives and how this information could make their lives easier were frequently emphasized during the lesson. The gradual progress of the course content and the use of interesting, original, and up-to-date materials were planned to help teacher candidates have positive attitudes and low anxiety levels. These techniques and materials were used not only in the experimental group but also in the control group due to the nature of the course. In a similar study, Uygun (2012) reported that the experimental group, in which they applied self-regulation strategies, had a more positive attitude towards writing than the control group. Köroğlu (2010) stated that the success levels of pre-service teachers with high levels of anxiety were low and that their reading anxiety stemmed from factors such as the atmosphere of the classroom, the attitude of the teacher, the personal reasons of the student, the reading texts and the activities of the reading texts.

Horwitz (1986) revealed that anxiety is an important factor preventing achievement. While the level of anxiety experienced in foreign language classes negatively affects the attitude towards the lesson, a negative attitude triggers the level of anxiety (Hussain, Shahid, & Zaman, 2011). In this study, the experimental and control groups exhibited positive attitudes towards English reading and writing skills. Although the anxiety scores of the experimental group were low, they were higher than the control group. It may become significant to have anxiety, which has negative effects on the learning process and attitude, at a low level in terms of activating the cognitive process and motivating the learner during learning (Kellogg, 1999). Considering the foreign language learning processes, it is possible to say that anxiety has positive effects on it (Phillips, 1992). It was expected that the pre-service teachers in the experimental group, who had a higher level of anxiety compared to the control group, exhibited more positive attitudes towards both skills. A positive attitude, in addition to the improvement of these skills, is also effective in the development of individuals in the whole learning process (Baki, 2017). When the achievement test scores are considered, it is seen that low levels of anxiety and a positive attitude led to higher achievement scores.

Upon the results of this study, in which the effect of teaching based on self-regulation strategies on pre-service teachers' achievement in reading and writing lessons, self-regulation strategies, attitudes, anxiety levels, and self-efficacy beliefs, the following suggestions were made for educators, educational researchers, teachers, and instructors: It has been observed that self-regulated teaching has a positive effect on the academic achievement of pre-service teachers. For this reason, the teaching and use of self-regulation strategies and the self-evaluation processes for these strategies can be included in the programs by teachers, instructors, and program developers while preparing the curriculum. In the pre-service period, pre-service teachers can receive training on self-regulation strategies, and processes such as the use of strategies and the transfer of these strategies to students can be included in the professional teaching knowledge course programs. According to the anxiety measurements of

the experimental and control groups, it was seen that the pre-service teachers had a certain level of anxiety, and this anxiety did not change before and after the instruction. Considering that low levels of anxiety in teaching and learning processes can be beneficial in terms of motivation and reaching the goal, it can be said that pre-service teachers who receive foreign language teaching education should maintain their anxiety.

For this reason, curricula can include activities that encourage low levels of anxiety and have difficulty appropriate to the level of learners, as well as exams. It was observed that pre-service teachers in both groups had positive attitudes before and after the instruction. It was discovered that the implemented self-regulated teaching did not harm the attitudes of teacher candidates. It is important to have a positive attitude both as a teacher and as a student in the education process. For this reason, it is important that the teaching activities prepared, as in this study, do not adversely affect existing positive attitudes. Activities that reinforce positive attitudes and self-regulation strategies can be included in the prepared curriculum.

#### Statements of Publication Ethics

The authors declare that any kind of unethical behavior is avoided concerning the principles of publication ethics. Ethics Committee Approval was taken from Abant İzzet Baysal University issued by 2017/223.

#### Researchers' Contribution Rate

Authors	Literature review	Method	Data Collection	Data Analysis	Results	Conclusion
Author 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Author 2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

#### Conflict of Interest

The authors declare that there is no conflict of interest in this study.

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