Investigation the Relationship between Online Homework, Academic Success and Self-Regulation

Recep Kahramanoğlu, Assoc. Prof. Dr., Gaziantep University, kahramanoglu@gantep.edu.tr
iD 0000-0001-6670-8165

Büşra Dursun, ELT Teacher, Ministry of National Education, busra_dursun92@hotmail.com
iD 0000-0002-0266-7488

Abstract

This research aimed to investigate the relationship between pre-service teachers' online assignments, academic success, and self-regulation skills. In this study, the correlational research design was used. The research was conducted with 124 pre-service teachers studying in different departments of Elementary Mathematics, Turkish, and Social Studies Teaching at Gaziantep University in the 2020-2021 academic year. Three extreme values were determined and the answers of a total of 121 pre-service teachers were used as data. The scale for assignment effort, the scale for reflective thinking ability and the assignment evaluation rubric were used as data collection tools. As the result of the research, it is seen that pre-service teachers' online assignment scores and average academic levels are high. When the assignment qualities of the pre-service teachers, their reflective abilities on teaching, assignment effort and academic success were examined in terms of department variable, the departments with the highest average academic success and reflexivity sub-dimension score were elementary school mathematics teaching, Turkish language teaching and social studies teaching respectively. It was also found that the assignment qualities of the pre-service teachers predict the academic success and assignment effort in a positive direction.

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INTRODUCTION

The ability to maintain and control thoughts, feelings, behaviors, and the social environment is known as self-regulation (Bandura, 1986). Learners can observe their own learning processes since self-regulation is a psychological activity. As a result, for many years, psychologists and social scientists working in the teaching-learning process, as well as educators, have been fascinated by the concept of self. People's concern about modifying their behavior, on the other hand, is new (Bandura, 1986; Zimmerman & Kitsantas, 2014; Zimmerman & Schunk, 2012). When a person observes a change in their behavior, it affects the learning and teaching process. By incorporating Bandura's Social Cognitive Learning theory, the concept of self-regulation (Zimmerman, 1995), which is new to the cognitive and social-cognitive research domains, has taken on a new dimension. According to Bandura (1989), when it comes to guiding their lives, people make use of the connection between mental processes and the environment. Individuals possess a self-control system that allows them to exert some control over their ideas, feelings, motives, and behaviors (Bandura, 1977). To some extent, the environment has an impact on behavioral development and socialization (Bandura, 1989). Individuals can take responsibility for their learning, test and assess their learning, and learn how to learn in this environment (Vermunt, 1995; Baumeister and Vohs, 2007).

Students can methodically arrange their learning through various regulatory processes using the notion of self-regulation and self-regulation tactics, which are widely recognized as one of the most significant determinants for success and performance. The sub-components of self-regulation, which is an umbrella concept, are metacognitive learning, self-observation, self-monitoring, self-evaluation, self-thinking, self-efficacy, sense of responsibility, motivation, motive, will, self-judgment, internal reaction, effort, and reflection (Ramdass, Zimmerman, 2011; Zimmerman & Martinez-Pons, 1990; Zimmerman, 2008; Stoeger and Ziegler, 2006).; Çiltaş, 2011; Ceylan, 2020; Eğmir, 2019). Other significant components of the idea of self-regulation include effort management and control of students' learning processes, self-evaluation of their learning, and learning reflection skills. Therefore, in the process leading to academic success, individuals taking their own learning responsibilities with homework, internalizing knowledge, developing self-efficacy skills, checking for previous achievements and background factors related to self-efficacy achievement (Kotoman, 2013), being willing to learn, learning motivations, time management, which strategies, methods and techniques can be used are closely related with self-regulation skills. To better understand the relationship between the concept of self-regulation and its components, we need to look at the background of related concepts.

SELF-REGULATION-HOMEWORK

Homework is viewed as one of the techniques to strengthen self-regulation skills of individuals (Corno, 2000; Ramdass & Zimmerman, 2011). If homework is properly planned and implemented, it can aid in the retention of knowledge, as well as the strengthening and deepening of knowledge. As a result, homework is critical in helping kids improve their metacognitive self-regulation (Dökmecioğlu, 2017). Students are using self-regulation skills while doing homework. For instance, they employ cognitive and metacognitive strategies to sketch the overall structure of the homework, describe the subject, and fill in the gaps before beginning an assignment (Ramdass & Zimmerman, 2011). In this way, students can control their learning and thus discover their shortcomings and weaknesses. Students with good self-regulation skills have a greater belief in their abilities and self-improvement, thus they have a greater belief in what they can do during the homework process. As a result of the fact that students who are aware of their learning process, aware of their abilities, and actively participate in the learning process can achieve the success they desire in their homework (Bembenutty and White, 2013). Researchers sought to better understand the significance of homework for academic success and to investigate the variables that link the two concepts. While some homework researchers suggest in their studies that homework improves academic performance, others disagree (Dillard-

Eggers et al. 2011, Sundgren, 2012); and others argue that it has a neutral relationship (Cooper et al., 2006), and some researchers even argue that homework negatively affects students in this regard (Bolat, 2016; McReynolds, 2005). It has been put forward that homework takes the students' rest time (Warton, 2019) and causes surfeit in the students (Kohn, 2007).

EFFORT-HOMEWORK

A concerted effort is being made to prevent failures, intervene in failures, and take appropriate action in the event of failure (Chen, 2002).It is a measure that defines how hard students work to achieve learning (McLeod, 1992).It is critical for academic achievement since it not only demonstrates accountability for completing objectives, but it also establishes a habit of using learning tactics on a regular basis (Pintrich et al., 1991).Individuals who can manage their effort should be able to withstand failures and take the necessary precautions in the event of a failure (Chen, 2002).The term "effort toward homework" was used in the study to describe students' focusing on homework while doing homework and regulating their attempts to complete their assignments without being influenced by other stimuli (Chen, 2002). Students with good self-regulated learning skills, according to Zimmerman (2005), can build their knowledge and skills independently and act independently in directing their efforts as necessary, even without the assistance of teachers, families, or peers.

Meyer (2005) defines homework as "research, learning or completing a task". Achievements of students increase when they focus on assignments because they are naturally motivated and have solid study habits (Meyer, 2005). The key findings include the fact that homework effort has a better success relationship than homework duration. Trautwein (2007) found that homework effort was significantly and positively associated with both test grades and academic achievement of students in their study to evaluate the relationship between the time devoted to homework and the effort spent on homework. According to Trautwein (2007), the impact of homework on accomplishment is most likely attributable to the effort put in rather than the amount of time spent on it. High achievers are just as likely to be inspired to work harder on their homework.

REFLECTION-HOMEWORK

Students can learn from their experiences through reflection, which is a natural process (Dewey, 1963). Reflective thinking is a succession of interconnected and successive thoughts, rather than a simple list of thoughts (Dewey, 1963). It aids pupils in developing their ability to adjust to changing settings and gaining experience so that they can practice in these situations (Dewey, 1963). Reflective thinking and self-regulation are notions that influence and are influenced by each other at this juncture. While reflective thinking improves the depth and frequency with which a person's self-regulation behaviors are controlled, people who have this capacity also reassess their learning. Individuals who are able to assess their cognitive learning are better able to control their performance and conduct (Loizidou & Koutselini, 2007). Individuals with the ability to reflect can assess their actions and thoughts (Pajares, 1995; Bandura, 1991).

In a study of homework scores, Stoeger and Ziegler (2006) found that variables such as self-efficacy beliefs, learning goal orientation, and time management skills were associated with increased math performance in homework performance learning. Individuals who utilize self-regulation skills within the research's scope demonstrate significant improvements in homework effectiveness, time management skills, self-reflection skills, and mathematical performance skills.

SELF-REGULATION-ACADEMIC SUCCESS

According to the study's findings (Zimmerman, 2005), there is a substantial link between self-regulation and academic success (Zimmerman & Schunk, 2012). It has been demonstrated that kids that adopt self-regulated learning strategies in the learning process reach higher academic accomplishment than other students (Zimmerman & Martinez Pons, 1986, 1988, 1990). However, it is not enough for learners to have self-regulated learning skills. Information that is repeated and

reorganized for assignments under the individual's efforts also helps them succeed academically by improving their own motivation (Ghosh, 2011). At this point, self-regulation is a concept related to homework. Homework expectation evaluates "students' beliefs about the successful implementation of target-directed behavior" (Eccles & Wigfield, 2002) and assumes that self-regulation skills also affect homework expectations and output (Wigfield et al., 2015). This premise implies that homework and self-regulation are intertwined notions.

Meyer (2005) examined the use of self-regulation skills in homework to improve academic performance. In his/her research, which he accepted as dependent variables, percentage of homework completed and semester grade point average; he found that the percentage of homework completed was found to be significantly positively correlated with social studies academic performance. Teachers also indicated that once students' self-regulation interfered with assignments, academic achievement in social studies classes increased. Swezey (2004) argues that traditional education is insufficient in facilitating effective learning and that individual learning styles should be examined in the teaching process in his study to compare the effects of academic achievement, traditional assignments and learning style, self-awareness, and homework. While five studies (Dean, 2004; Meyer, 2005; Minotti, 2005; Pool, 2005) conducted in the United States examined students grade levels of homework and organization; some studies have examined how it affects the perceptions of teachers and students. Interventions include web-assisted assignments (Dean, 2004), self-regulated assignments (Meyer 2005), and learning style-based homework (Minotti, 2005). All of the self-regulated behaviors and environmental events in the learning process affect each other, and this can increase the academic achievement of individuals in certain ways (Kader & Eissa, 2015). So, in relation to findings from various research, when a homework assignment or editing is presented using an advanced pedagogical style or strategy, student achievement improves somewhat to moderately. Furthermore, students' motivation and self-esteem levels have been shown to have a considerable and positive impact on self-regulated assignments (Dean, 2004; Minotti, 2005).

ACADEMIC ACHIEVEMENT-HOMEWORK

Academic achievement is defined as a student's level of skill in relation to a specific curriculum or program (Cevizci, 2011). While academic success is defined as a student's ability to achieve a goal within the confines of a plan (Demirel, 2012), homework is one of the most basic activities associated with academic success in the learning-teaching process (Cooper, 2008). To ensure students' academic achievement, homework planned for an effective learning environment can provide a series of self-regulation exercises that can help students achieve academic success. In this regard, Özben (2006) found that homework improves students' academic progress in his/her education. In addition to providing successful learning settings, individuals can take on their learning responsibilities and increase their academic achievement by developing assignment study strategies, boosting their academic success, teaching effectiveness, and goal-achieving levels (Kara & Bay, 2016). From here we can conclude that there is a link between self-regulation skills and academic accomplishment arises. Individuals' taking responsibility for their learning with homework, internalizing knowledge, developing self-efficacy skills, being willing to learn, motivation to learn, time management, which strategies, methods, and techniques can be used, and their self-regulation skills have been the focus of this research in the process leading up to academic success.

CONCEPTUAL FRAMEWORK

Pre-service teachers who can organize their own learning through assignments will be able to understand their cognitive abilities and accept how they can further increase their academic motivation. From this point of view, when the research is analyzed, it is clear that when homework activities are accompanied by self-regulation abilities, students' academic progress and attitudes about homework improve (Aldosary, 1995; Schubert, 2004).While research on the idea of self-regulation is included in the worldwide literature, investigations conducted in domestic literature within the

framework of this concept still have limits (Arsal, 2009; Özmenteş, 2008; Taş, 2014; Üredi & Üredi, 2005). When looking at domestic studies that focus solely on the relationship between homework and academic achievement, it is argued that homework improves academic achievement (Büyüktokatlı, 2009; Genç, 2019; İyiöz, 2019; Şentürk, 2013), whereas in other studies, no significant relationship between academic success (Kapıkıran ve Kıran, 1999; Bora, 2018) has been found.

When the studies examining the relationship between homework and self-regulation skills, it is seen that if self-regulated learning level is increased, it is reflected in these assignments (Arıkan, 2020), students' metacognitive abilities are effective in homework and academic success (Deniz, 2019), it has been found that self-regulated learning increases students' desire to learn (Çokçalışkan, 2019). There are many studies conducted about self-regulation. Considering the findings of these studies, but the relationship between self-regulation and its sub-components, homework, and academic accomplishment has not been well investigated. This study is significant since it is the first of its kind at this time, it gives key data about the sub-dimensions of the self-regulation variable, and it will contribute to future research. This study is significant in terms of uncovering the link between online homework performance, self-regulation skills subcomponents, reflection and effort, and academic success among pre-service teachers.

When studying the relationship between homework performance, self-regulation skills, and academic success, it is clear that there are different variables across these concepts. The variables that fall between homework and self-regulation abilities have been discovered to play an important role in academic progress (Ainley & Patrick, 2006, Barnard, et al., 2009).

Based on this situation, the sub-components of self-regulation abilities (reflection and effort) were initially addressed in this study, and the relationship between homework performance, reflection, effort, and academic achievement was investigated.

In this study, it was aimed to examine the relationship between pre-service teachers' online homework and their academic achievement and self-regulation skills. In line with this purpose, answers to the following questions were sought within the scope of the research.

1. Is there a significant relationship between pre-service teachers' online homework score, reflection skills for learning, effort towards homework, and academic success?
2. Does online homework score of pre-service teachers predict academic success?
3. Does online homework score of pre-service teachers predict homework effort?

METHOD

RESEARCH DESIGN AND PARTICIPANTS

The association between online assignments, self-regulation skills, and academic achievement was examined using a correlational methodology in this study. The reason for using this methodology is to examine the relationship between variables without intervention. It was aimed to examine the co-changes of the variables within the scope of the research. The study included 124 pre-service teachers who studied in the Departments of Elementary Mathematics, Turkish, and Social Studies Teaching at Gaziantep University in the 2020-2021 academic year and took the Teaching Principles and Methods course. Of the pre-service teachers participating in the research, 89 (71.77%) were female and 35 (28.22%) were male. 30(24.19%) of the pre-service teachers are in the Turkish Language Teaching program, 57 (45.96%) are in the Primary Education Mathematics Teaching program, and 37 (29.83%) are in the Social Studies Teaching program. The average age of pre-service teachers is 20.

DATA COLLECTION

DATA COLLECTION TOOLS

In the study, the "Homework Effort Scale" was used to determine pre-service teachers' efforts towards homework, "Reflective Thinking Skills Scale" to measure their reflection skills for learning, "Homework Evaluation Rubric" to determine their homework performance, and year-end exam scores to determine their academic success.

HOMEWORK EFFORT SCALE

The scale was developed by Trautwein, Lüdtke, and Schneyder (2006) and was adapted into Turkish by the researchers of this study. The draft scale was administered to 207 pre-service teachers to examine the construct validity of the Homework Effort Scale, and 20 data were eliminated from the data set due to excessive values. Analysis was carried out with the remaining 187 data sets. With reference to the results of the analysis, the fit index values of the scale (MLRχ2 = 21.248; df = 12; CFI = .96; GFI = .97; TLI= .93; RMSEA= .064; 90% CI [.008-.108]; SRMR = .063) was obtained. RMSEA ≤ .10 as a criterion for fit indices (Browne and Cudeck, 1992; MacCallum, Browne, and Sugawara, 1996; Kenny, Kaniskan, and McCoach, 2014); χ2/df < 5; SRMR < .08; CFI, GFI, and TLI > .90 (Hu and Bentler, 1999; Kline, 2016). The fit indices of the measuring tool, which are used to compare the analytical results to the relevant criteria, are within acceptable ranges, and the scale has construct validity. In addition, item factor loading values ranged from .47 to.97. The internal consistency reliability coefficient of the measurement tool was calculated as 68.

REFLECTIVE THINKING SKILLS SCALE

Reflective Thinking Skill Scale was developed to measure the reflective thinking skills of the pre-service teachers. This scale was developed by the researchers of this study. As a result of the literature review, the "Reflective Thinking Skill Scale", a Likert-type draft scale consisting of 13 items and three sub-dimensions of students' reflective thinking skill levels at the end of a lesson, namely understanding, reflection, and critical reflection, was prepared based on Mezirow's (1977, 1981, 1985, 1991, 1992) view. Confirmatory factor analysis (CFA) was found sufficient to test the construct validity of the draft scale form, which was piloted with 207 individuals. Since 20 data are outliers, they were excluded from the data set. Analysis was carried out with the remaining 187 data sets. In line with the results of the analysis, since the factor load value of an item in the comprehension dimension was below 30, it was removed from the measurement tool and the 13-item scale form was reduced to 12 items. The fit index values of the 12-item scale were calculated as (MLRχ2 = 113.247; df = 62; CFI = .92; GFI =.91; TLI = .93; RMSEA=.66; 90% CI [.047- .086]; SRMR = .069). The criteria used in the construct validity of the homework effort scale were used as criteria for the fit indices. When the findings of the analysis are compared to the relevant criteria, it may be concluded that the 3-dimensional measuring tool's fit indices are within acceptable bounds and that the scale has construct validity. In addition, item factor loading values ranged between.40-.75. The internal consistency reliability coefficient of the measurement tool was calculated using Cronbach's Alpha reliability coefficient. When the reliability coefficients of the sub-dimensions are examined, Cronbach's Alpha value for the whole scale was calculated as .803. Item-total correlation values ranged from .347 to .619.

HOMEWORK ASSESSMENT RUBRIC

This rubric, created by the researcher, was used to assess pre-service teachers' homework processes and content. The developed rubric has five dimensions, with each dimension's ratings divided into nine sub-dimensions. There are competencies determined in line with general teaching principles and the processes of planning teaching circumstances on the scale, which consists of the dimensions of time, completion, content, originality, and integrity (compatible). Some of the evaluation expressions in the rubric are as follows; the homework has been submitted by the deadline, all sections of the homework are relevant to the topic, the homework contains original information

throughout the entire process. Following the development of the rubric, two experienced specialists in the field of educational sciences with the titles of doctor and associate professor were consulted. Following the evaluations, certain illogical expressions were reorganized and rewritten in a more clear and intelligible manner. The purpose of the rubric was to see how well pre-service teachers performed their coursework on general teaching principles and how well they planned their teaching scenarios. In the prepared rubric, there are 1-4 levels for each step. The rubric's maximum and minimum points are 28 and 5 points, respectively. The scores collected from the rubric in this period were transformed to the hundred grade system to indicate the success of the students in relation to these scores.

DATA COLLECTION PROCESS AND ANALYSIS

During the research, data were gathered through scales and assignments applied online. During the data collection process, four homework were given to pre-service teachers at regular intervals. In the process, a total of 484 assignments were included in the homework evaluation and analysis process. Students, researchers, and lecturers used the distant education system to follow homework and homework contents during this study. On this system, interactions were carried out through the course and homework modules. The contents of the homework were read one by one and diligently graded with reference to the criteria at each level during the homework analysis procedure. By calculating the scores obtained from the rubrics, the participants' online homework scores were evaluated and accepted. Pre-service teachers who obtained full marks on all levels were awarded 100 homework points out of hundred-point system, and their grades were recorded. The students were informed about the findings of the analysis, and a rubric was created to help potential teachers with their next task. After the homework process, 124 out of 149 pre-service teachers filled in the 19-question scale applied to the pre-service teachers after the homework process. Three extreme values were determined and the answers of a total of 121 pre-service teachers were analyzed. The rate of participation in the survey was determined as 87.94%. The responses given for the sub-problems whose answers were sought were uploaded to the computer, and the appropriate statistical analyses were performed using the SPSS package program, all within the scope of the research. The Pearson correlation coefficient was used to calculate the extent of the link between online homework score, reflection, effort, and academic accomplishment. Simple linear regression analysis was used to measure the level of accuracy in predicting academic accomplishment of online assignments and homework effort.

Before performing the regression analysis, to determine whether the assumptions of performing the regression analysis are met;

1. Look at the linear relationship-Scatter diagram.
2. Covariance-Scatter diagram is checked.
3. Independent errors-Durbin-Watson value is expected to be around 2.
4. Normality -QQ plot (Zach,2020)

It was determined from both the Scatter diagram and the correlation analysis that there was a linear relationship between the variables. The homogeneity of the residual values can be called homogeneous distribution, and it was observed in this study to be homogeneously distributed as well. For independent errors, residual values are expected to be independent, which is determined by the Durbin-Watson test. In this study, the Durbin-Watson value was calculated as 1.96. Finally, the data are normally distributed since the data are cleaned and outliers are cleaned before regression analysis is performed (Skewness value varies between -.755 and -.240 and Kurtosis values range from -.315 to -.580)

FINDINGS

FINDINGS RELATED TO THE FIRST SUB-PROBLEM

Findings related to the first sub-problem of the study, "Is there a significant relationship between online homework score, reflection skills for learning, effort towards homework, and academic success?" are given in Table 1.

Table 1. *Results of Correlations between Pre-Service Teachers' Online Homework Scores, Learning Reflection Skills, Homework Effort, and Academic Success Levels*

Variables	Online Assignment	Academic Success	Reflection	Effort
Online Homework Score	1	0.289**	0.094	0.189*
Academic Success Score		1	-0.001	-0.079
Reflection Skill			1	0.385**
Level of Homework Effort				1

N=121; *p<0.05; **p 0.01(2-Way)

It has been discovered that there is a low-level positive and substantial association between pre-service teachers' online homework and their academic success, learning reflection skills, and homework effort. There is no link between pre-service teachers' academic performance ratings and their ability to reflect on their learning or their degree of homework effort.

FINDINGS RELATED TO THE SECOND SUB-PROBLEM

Regarding the second sub-problem of the study, "Does online homework score predict academic success?", it was tried to determine the predictive power of pre-service teachers' online homework scores on their academic success. Table 2 shows the results of simple linear regression analyses used to see if the independent variable significantly predicted the effect on academic success.

Table 2. *The Effect of Pre-Service Teachers' Online Homework Scores Variable on Academic Performance Scores was Predicted Using Simple Linear Regression Analysis*

Dependent Variable	Independent Variable	B	Standard Error	β	t	P
Academic Success Score	Online Homework Score	62.463	4.971	0.289	12.566	0.000**
R= 0.289	R^2= 0.084	Adjusted R^2 = 0.076		F= 10.883		P= 0.001

N=121; **p< 0.01

When Table 2. is examined, the effect of the online homework score on the academic achievement score is seen. In accordance with the results of the regression analysis, it was determined that the online homework scores of the pre-service teachers participating in the research had a statistically significant effect on their academic achievement scores (F=10.883, p=0.000). It has been discovered that the online homework scores of teacher applicants predict their academic accomplishment scores. On the effect of online homework scores on academic performance scores, it has an 8% variance explanation rate (R^2=0.084). Accordingly, it can be said that about 0.1% of the variance explained for academic achievement scores is due to online homework scores.

FINDINGS RELATED TO THE THIRD SUB-PROBLEM

Regarding the third sub-problem of the study, "Does online homework score predict homework effort?", it was tried to determine the predictive power of the online homework scores of the pre-service teachers for the homework efforts levels. The findings of simple linear regression analyses were used to see if the independent variable significantly predicted homework effort; the results are shown in Table 3.

Table 3. *Simple Linear Regression Analysis Results Regarding the Prediction of the Effect of Pre-Service Teachers' Online Homework Scores Variable on Homework Effort Level*

Dependent Variable	Independent Variable	B	Standard Error	β	t	P
Effort Level	Online Homework Score	3.228	0.233	0.189	13.863	0.000**
R = 0.189	R^2= 0.036	Adjusted R^2 = 0.028		F= 4.407	P= 0.038	

N=121; **p< 0.01

With reference to the results of the regression analysis, it was determined that the online homework score of the pre-service teachers participating in the research had a statistically significant effect on their level of effort towards homework (F=4.407, P=0.000). It has been discovered that pre-service teachers' online homework results predict their homework efforts. The effect of the online homework score on the level of effort has a variance explanation rate of 4% (R^2= 0.036). Accordingly, it can be said that approximately 0.04% of the variance explained for the level of effort towards homework is due to the online homework score.

DISCUSSION, CONCLUSION AND IMPLICATIONS

Within the scope of the study, the relationship between online homework score, reflection skills for learning, effort towards homework, and academic success was examined, and it was determined that the academic success score averages of pre-service teachers were higher than online assignment score averages in accordance with the descriptive statistical values obtained from the online homework scores, reflection skills for learning, effort towards homework, and academic achievement data. This could be because pre-service teachers regard the exam, which is intended to assess academic achievement, as a more reliable assessment criterion and devote more time to studying for it. In the literature, studies on the association between homework and academic accomplishment may be found, but studies on the sub-components of self-regulation skills, reflection, and effort are scarce. It has been stated that the attitudes of students with high self-regulation skills towards the course differ positively (Ceylan, 2020). It is thought that one of the ways to develop self-regulation skills is homework (Trautwein & Koller, 2003). Homework is vital for pupils to develop responsibility skills and boost academic success, according to Genç (2019). Dignath and Buttner (2008) think that developing self-regulation in students should be among the primary goals of education.

Regueiro, Núñez, Rodríguez, Piñeiro, and Rosário (2016) stated in their study that there is a positive relationship between completing the homework given and student achievement. It is believed that homework prepares students for class, and homework promotes student success by making the learning more permanent. By understanding the path followed during the homework process and commenting on the process outputs, students can transfer their experiences for their further learning. According to Büyüktokatlı (2009), students who do homework regularly are more successful than those who do not. Homework is regarded to be useful in making knowledge permanent and filling in knowledge gaps, as well as supporting one another. Homework also improves students' ability to do it by reinforcing their weaknesses (Cooper, 2008).

In line with the correlation analysis between online homework performance, reflection skills for learning, effort towards homework, and academic success, it was found that there was a low positive relationship between pre-service teachers' online homework performances and academic success and homework effort, reflection skills for learning, and homework-oriented effort levels. Other variables such as age, class level, working habits, homework duration, amount of homework, and absence of parallel content of assignments and tests may have contributed to the low relationship. When the studies conducted at home and abroad are examined, some studies investigating the effectiveness of homework on the academic performance show that homework increases academic success (Üstünel,

2016; Olpak, 2013; Akbaba & Tüzemen, 2015; Trautwein, Niggli, Schneyder, & Lüdtke, 2009), while others show that it does not increase (Hoover-Dempsey, 2001; Voorhis, 2003). A minimal level of association was established between online homework results and academic performance scores within the scope of the study. There are studies in the literature that support this view. According to Hoover-Dempsey et al. (2001), although assignments are included in the learning process, the link between them and academic success is not clear and strong enough. Voorhis (2003) stated that the relationship between academic achievement and homework cannot be explained by causality. Cooper et al. (2006), there is no evidence that homework activities increase the academic performance of primary school students. Baker and LeTendre (2005), on the other hand, stated that countries with less homework in the education system are more successful academically. While a number of studies suggest that assignments may not improve academic achievement, others suggest that they do. It is noted, however, that homework that is appropriate for the student's level and helps the learning process promotes academic performance (Trautwein, 2007; Üstünel, 2016; İyiöz, 2019; Genç, 2019). Yalçın (2019), according to his study, stated that regardless of traditional or online homework, it positively affects the academic achievement of students. Özer and Öcal (2012) concluded in their study, that students participating in the research had positive opinions about homework and that homework positively affected their academic achievement. One of the reasons why the results of these research differed and a consistent conclusion could not be reached is because it is impossible to control the variables that influence academic accomplishment, and the quality, volume, and purpose of the homework assigned differ from one study to the next.

In the regression analysis that looked at the effect of the variable of pre-service teachers' online homework scores on their academic achievement scores, it was determined that the online homework scores of the pre-service teachers who took part in the study had a statistically significant effect on their academic achievement scores. It was concluded that the online homework score significantly predicted academic achievement with 8% variance explanation rate. When variables such as homework motivation, individual differences, homework quality, and attitude toward homework affect the association between homework and academic achievement, it can be concluded that not only homework but also these homework-related mediating variables have predictive potential.

The online homework score of the pre-service teachers had a statistically significant effect on the degree of homework effort, in accordance with the regression analysis in which the online homework score predicted the effort toward homework. It was concluded that the online homework score significantly predicted the level of effort towards homework with a 4% variance explanation rate. The fact that pre-service teachers are aware of what they can and cannot do to achieve academic goals clearly reveals the statistical effect between these variables. Kaya (2020), on the other hand, found a positive relationship between mathematics achievement and homework completion effort only in the 5th grade. In his/her study, Taş (2013) found that students who do their homework with as much effort as possible have more successful course grades. Willingness and efforts of individuals to reach the goal affect their academic success (Liu & Koirala, 2009). Piñeiro and Rosário (2016) stated in their study that there is a positive relationship between completing homework and students' success. Students need to develop methods and techniques suitable for them so that they can take their learning responsibilities and carry out self-regulated work (Yılmaz, 2013).

AUTHOR CONTRIBUTION

- First author has made a substantial contribution to the conception and design, acquisition of data as well as the analysis and interpretation of the data,
-The second author has made a substantial contribution to the conception and design as well as the analysis and interpretation of the data.

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