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## An Analysis of the Effect of Writing-to-Learn Activities Regarding Students' Academic Achievement and Self-Regulation Skills in Writing

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The aim of this study is to investigate the impact of writing-to-learn activities on students' academic achievement and self-regulation skills in writing. Using the quasi-experimental design, the study was performed involving 64 eighth grade students, who were studying in two different classrooms at the same secondary school. The students in the experimental group were handed out a number of writing-to-learn activities, while those in the control group were taught according to the current curriculum during the application. The academic achievement test, self-regulation scale for writing, and holistic assessment rubric were designated as the required tools for data collection. As a result of the application, the academic achievement and self-regulation skills of the students in the experimental group were found higher than those of the students in the control group. It was also noted that the experimental group showed a development over time to integrate the information they learned, and to present it as a new product with their own expressions after the process of reviewing, planning, sorting and organizing. The students in the experimental group showed a great deal of interest in writing-to-learn activities and were willing to participate in them. It is believed that the writing-to-learn model, which seems to have positive effects on learning processes, may be a desirable option to come up with effective and high-quality teaching methods.

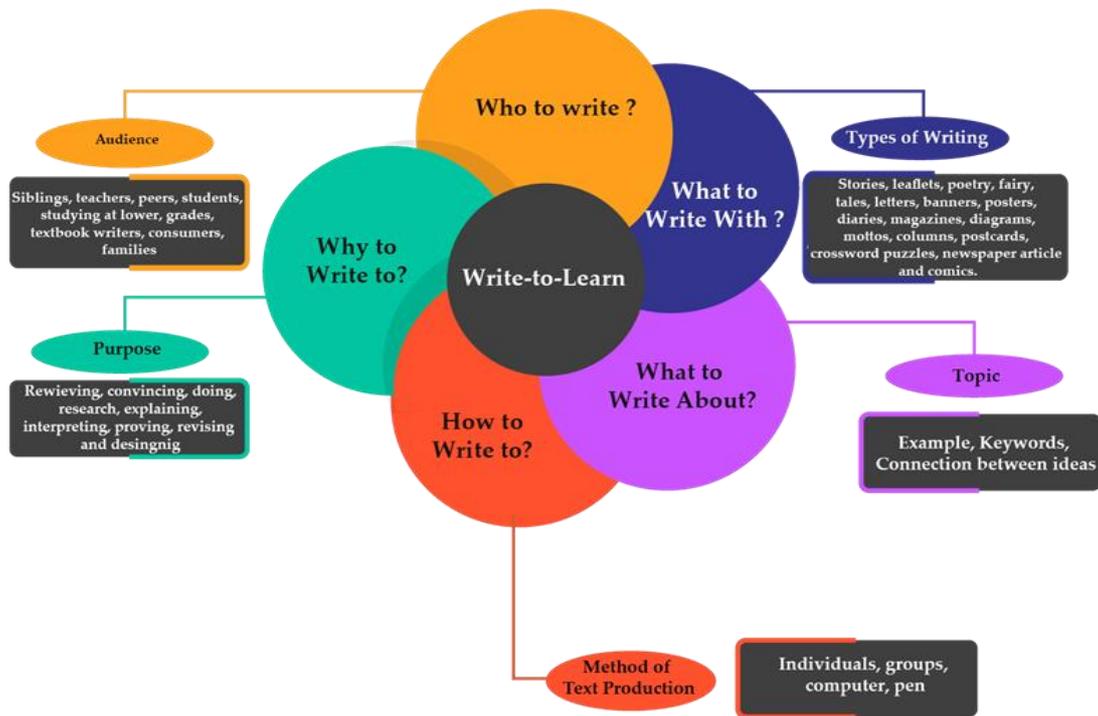
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## Introduction

As a unique tool of learning, writing (Emig, 1977), is one of the most preferred learning activities (Klein, 1999). Being a critical skill as well as a potential tool for learning (Arnold, et al., 2017), writing is definitely not an easy task (Galbraith & Baaijen, 2018). In addition to encouraging and promoting the cognitive learning strategy (Bangert-Browns, Hurley & Wilkinson, 2004), writing is a process that requires a cognitive effort at the heart of learning (Boscolo & Mason, 2001). In this process, writing also ensures the use of cognitive structures that can facilitate learning, either implicitly or explicitly (Graham, Kiuahara & MacKay, 2020). Since writing is a cyclical process composed of some sub-processes such as planning, outlining, and organizing (Applebee, 1984), it is necessary to use different ways of thinking (Hohenshell & Hand, 2006). It also allows students to experience the process of learning through writing (Galbraith & Rijlaarsdam, 1999). This experience is the centre of learning for what has previously been acquired, what is being lived through, and what is planned for the future (Emig, 1977). At this point, writing takes the form of contemplating about a subject, after which the relevant thoughts are developed and organized to integrate the previous knowledge with the knowledge acquired (Bozkurt, 2017), and create a new knowledge-based product (Lawwill, 1999). In other words, writing is the learning process in which we think about what we know or learn, and review our experience (Graham, 2008). From this standpoint, although many researchers (Bereiter & Scardamalia, 1987; Flower & Hayes, 1981; Haley-James, 1982) have explained how writing activities affect learning, or how learning is achieved through writing, Emig (1977)'s study "Writing as a Mode of Learning" pioneered the use of writing as a learning model in addition to the communication process.

Although writing is often used as a tool for learning (Arnold, et al., 2017), it is not easy to define the writing-to-learn model (Klein & Boscolo, 2016; Graham, Kiuahara & MacKay, 2020). Writing-to-learn does not refer to a student's customary, passive and simple note-taking action for particular information that a teacher attempts to convey or that is written in textbooks (Yore, Bisanz & Hand, 2003), yet it is a non-traditional, alternative type of writing (poetry, stories, letters, and alike) that enables students to develop critical thinking skills (Kayaalp, Meral, Şimşek & Şahin, 2020; Sinaga & Feranie, 2017), comprehend scientific content, express what they think (Mason & Boscolo, 2000), build information (Tynjala, 1998), as well as activating them in learning processes (Öztürk, Öztürk & Işık, 2016). Writing as a means of learning, which is used as an alternative way to learn and develop current information in the school curriculum (Bazerman, et al., 2005) constructs new information on previous information (Putti, 2011), ensures that scientific information is permanent (Rivard & Straw, 2000) and facilitates to understand the concepts which are relatively difficult to grasp (Alharbi, 2015; Hohenshell, Hand & Staker, 2004). Teachers who implement such a learning strategy should be able to provide a full learning atmosphere for students and guide them through these activities while performing writing-to-learn tasks (Kieft, Rijlaarsdam & Van den Bergh, 2006). Yet, it is necessary that teachers be knowledgeable about what type to use for what purpose and how to make students write and design the process properly. With the aim of clarifying this important issue in the process of making use of writing for learning purposes, Hand and Prain (2002) presented a model for the application process of the writing activities for the sake of learning. We believe that the most practical and applicable approach for how writing should be used for learning purposes is the *writing-to-learn model* developed by Hand and Prain (2002, p.743), which is a reference to the implementation process in this study just like in many other studies in the literature. The model has, therefore, been revised and presented in Figure 1.



**Figure 1.** The writing-to-learn model

Activities included in the writing-to-learn model are used in line with the principles, namely, “purpose, topic, text production method, audience, and type of writing” (Hand & Prain, 2002), and they aim to improve higher-order thinking skills of students and flourish their knowledge (Yıldız & Büyükkasap, 2011), thereby ensuring cognitive knowledge and skill acquisition in a variety of fields of study (Rivard, 1994). A well-organized writing process has multiple effects on students such as creating hypotheses and proving them, generating new information from the content learned, and developing concepts and generalizations on the subject learned, as well as strengthening and expanding previously learned information (Beyer, 1982). In addition to these, it has other effects such as understanding, comprehending, and sharing the thoughts (Alharbi, 2015), facilitating learning (Ay & Başıbüyük, 2018; Karaçağıl, 2014; Walp, 2013), and ensuring permanent learning (Yasul, 2019). Another area where the action of writing proves effective is self-regulation and self-regulation skills in writing that developed accordingly.

### Writing-to-Learn and Self-Regulation Skills in Writing

Expressed as the ability of being aware of one’s emotions, thoughts and behaviours for the goals to be achieved, and of controlling the process, self-regulation (Bandura, 1991; Ormrod, 2015; Zimmermann & Kitsantas, 2014) is a concept that emerged on the basis of cognitive and social-cognitive research dating back to the early 1980s (Zimmermann, 1995). ‘Social Cognitive Theory’ of Bandura has an important impact on the development of this concept (Zimmerman, 2000). The interaction of personal, environmental and behavioural factors with one other (Bandura, 1991) assumes control in individuals’ own emotions, cognition, motivation and actions, and plays a self-regulating role in individuals (Pajares, 1996). Self-regulation, which activates individuals in this process by encouraging them to assume the responsibility of learning by applying metacognitive, motivating, and strategic actions (Aydın & Atalay Demir, 2015), enables individuals to make comparisons by using the criteria determined by observing their own behaviours and, if necessary, adjust their behaviours

according to those criteria (Senemoğlu, 2009). Self-regulation skills, which allow students to focus more on learning, get more organized, revise information to remember, and use environmental resources efficiently and effectively (Schunk, 1989), are critical for students in achieving success from early ages to all stages of learning (Alvi, et al., 2016). In addition, the development of self-regulation skills in individuals is of great importance not only in terms of academic achievement at school, but also in life outside school (Alvi & Gillies, 2015; Öz, 2020). Besides many factors, the effect of teaching processes is an indisputable fact in the development of self-regulation skills that affect both academic achievement and success in social life. In this context, it can be assumed that one of the teaching elements considered to be effective in the development of students' self-regulation skills is writing.

Necessitating a conscious effort and an analytical action, writing (Özbay & Daşöz, 2016) requires a comprehensive self-regulation as it is a complex process based on mental activities (Harris & Graham, 2016). Based on self-regulation, writing is a process in which individuals set goals, develop strategies by managing cognitive, affective, psychomotor, social and environmental factors, as well as applying those strategies for monitoring and evaluation purposes (Zimmerman & Risemberg, 1997). In the writing process, individuals can achieve active learning by organizing the stages of writing in their minds. In addition to the qualitative products that the students put forward during the self-regulation-based writing process, they are expected to manage cognitive processes such as setting goals, generating new ideas, making plans, and managing social processes such as environmental organization, peer interaction, and affective processes such as motivation for writing (Müldür, 2017). However, it has been shown that the classes in which the students are taught with self-regulation-based writing are collaborative, with the students being responsible, sharing, and respectful to one another, and that they constitute such learning environments where independent decisions are made (Perry & Drummond, 2002). In this context, considering the multidimensional effects of teaching in line with the self-regulated writing method on learning processes, it seems necessary to develop students' self-regulated writing skills. It is predicted that the use of activities for the purpose of the writing-to-learn model are likely to be effective to boost such skills of students.

Described as a unique way of learning (Emig, 1977), writing-to-learn method entails more recognition within social sciences teaching. The relevant literature has revealed that the use of writing-to-learn activities in learning processes focus more on science and mathematics rather than social sciences, which is contrary to what is anticipated (Aktepe, 2020; Caukin, 2010; Hand, Yang & Bruxvoort, 2007; Kingir, 2013; Kravchuk, 2015; Leffler, 2014; Nam, Choi & Hand, 2011; Putti, 2011; Ray-Parsons, 2011; Reilly, 2007; Uzoğlu, 2014; Yerlikaya & Güneş, 2020; Yıldız, 2012). In Turkey, the activities for the writing-to-learn model seem to be utilized to teach Mathematics and Science at different grades, but not applied sufficiently in social sciences, especially in the 8<sup>th</sup> grade course named the Turkish Republic, History of Revolution and Atatürk's Principles taught by social studies teachers (Ay & Başbüyük, 2018; Karaçağıl, 2014; Kayaalp & Şimşek, 2020; Yasul, 2019). The relevant studies in the literature, however, emphasize the need for different teaching materials to be used in the Turkish Republic, History of Revolution and Atatürk's Principles course and for the use of contemporary teaching methods in which the student can be active in the teaching process (Altıkulaç & Akhan, 2010). In addition, the applied studies using different methods and models are limited to the course named Turkish Republic, History of Revolution and Atatürk's Principles at the 8th grade. The studies conducted within the scope of this course focus on teacher and student views especially about the program or the course (Ayaydın, 2019; Bayram, 2016; Ezer, Ulukaya & Kaçar, 2016; Ginesar, 2017; Keskin, 2018; Palaz, Kılcan, & Gülbudak, 2019) and aim at identifying the problems related to the lesson (Gömcü, 2006; Kahramanoğlu, 2014; Karademir, 2014; Tangülü,

Tosun, & Kocabıyık, 2014). In this context, it is envisaged that this study, conducted as an experimental research based on both process and result, will make a positive contribution to the writing-to-learn activities to be involved in the 8<sup>th</sup> grade course named the Turkish Republic, History of Revolution and Atatürk's Principles. Considering the limited number of studies on the use of writing-to-learn model in that course, the present study is expected to serve the purposes of the literature. For such reasons, the current study attempted to analyse the multiple effects of writing-to-learn activities used in the aforementioned school subject. Answers were sought to the research questions given as follows:

- (1) Do the writing-to-learn activities have an effect on students' capacity to write for learning purposes?
- (2) Do the activities for the writing-to-learn model present a statistical significance in the academic achievement of students?
- (3) Do the activities for the writing-to-learn model create a statistical significance in students' self-regulation skills in writing?

## Method

### Research Design

This study was conducted with the quasi-experimental design- one of the quantitative research approaches- with a pre-test and a post-test control group. In experimental studies, it is possible to manipulate at least one independent variable and to examine the effects of the independent variable on one or more dependent variables by controlling other related variables (Gay, Mills & Airasian, 2012). In this research, the quasi-experimental design was preferred because it was aimed to explore the influence of the activities included in the writing-to-learn model on the academic achievement of students and self-regulation skills in writing.

### Study Group

The present study involved a total of 64 eighth grade students who were studying in two separate classes of a secondary school in the city of Zonguldak, Turkey in the academic year of 2019-2020. One of the classes was the experimental group (Experimental Group [EG], n = 31) taught in line with the writing-to-learn activities, while the other was the control group (Control Group [CG], n = 33), in which the current curriculum was used for teaching. Table 1 demonstrates the demographic data of the study group.

**Table 1.** Demographic Data of the Study Group

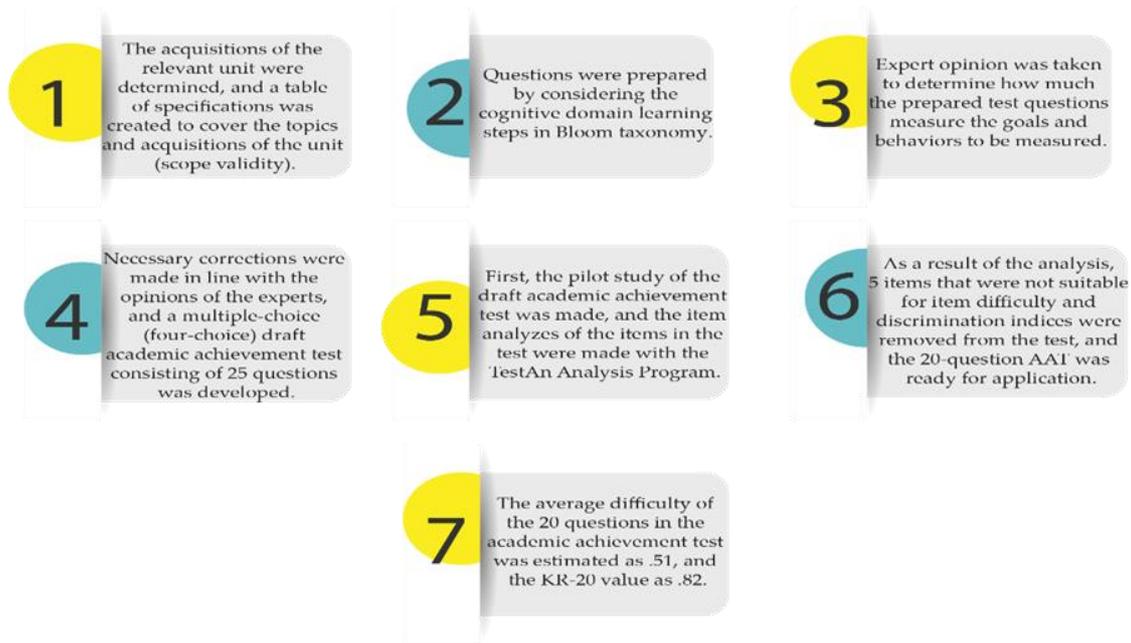
Groups	Gender	Frequency	Percentage (%)
EG	Male	11	35.48
	Female	20	64.52
CG	Male	16	48.48
	Female	17	51.52
Total		64	100

### Data Collection Tools

#### Academic Achievement Test

The "Academic Achievement Test" (AAT) was prepared by the researchers in order to determine the effect of writing-to-learn activities on the academic achievement of the students (the extent of students' achievement in learning the subjects of the relevant unit).





**Figure 2.** The development process of the academic achievement test

While preparing the achievement tests, it is desirable that the mean value of the item difficulty indices of the items in the test be 0.50 so that the relevant feature can be fully measured (Kan, 2017; Karaca, 2016). The mean difficulty of the test being around .50 makes a test more reliable and more distinctive (Tekin, 2000). The mean difficulty of 20 questions in the academic achievement test was calculated as .51 in the present study. In general, it is preferred that the Kuder Richorson-20 (KR20) value of a test that provides reliable measurements is at least .70 and above (Fraenkel, Wallen & Hyun, 2012). The KR-20 value of the prepared academic achievement test was calculated as .82 in the current study.

### *Self-Regulation Scale for Writing*

In an attempt to ascertain the effects of writing-to-learn activities on self-regulation skills of students in writing, the study used the Self-Regulation Scale for Writing (SRSW) developed by Müldür (2017) through validity and reliability studies. The scale, consisting of a total of 21 items, is composed of 4 sub-dimensions: monitoring and managing the process, making an effort, seeking help, and generating ideas. The scale was designed with 5-point Likert: “I Never Do, I Rarely Do, I Sometimes Do, I Usually Do, I Always Do”. The Cronbach’s alpha internal consistency reliability coefficient of the scale was found to be .85 by Müldür (2017). The Cronbach’s alpha coefficient of internal consistency reliability of the scale was calculated as .88 for this study.

### *The Holistic Assessment Rubric for Writing-to-Learn Activities*

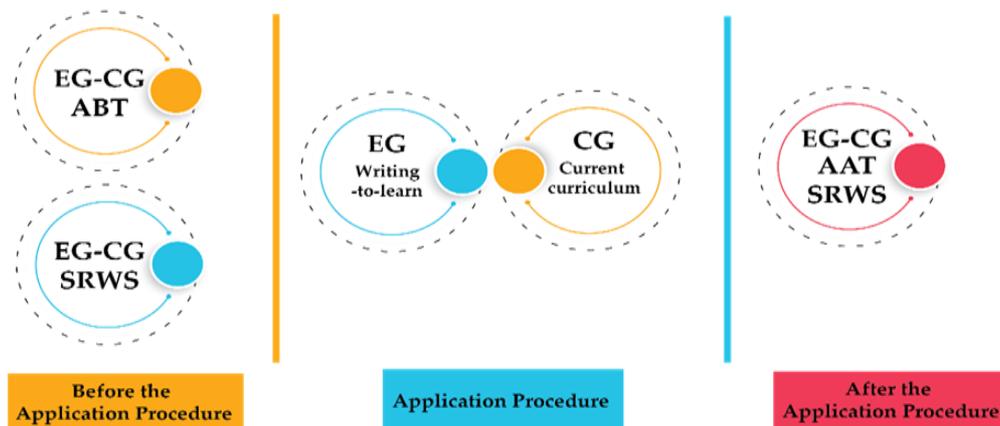
The basic components (audience, purpose, text production method, types of writing, and topics) of the writing-to-learn model introduced by Hand and Prain (2002) were taken into consideration for preparing the holistic assessment rubric for writing-to-learn activities developed by Kayaalp (2020) to determine to what extent such activities in the study boost students’ competence in writing-to-learn model. Table 2 presents the rubric in detail.

**Table 2.** The Holistic Assessment Rubric for Writing-to-Learn Activities

The Level of Writing-to-Learn Activity	Components
Level 1 (Weak)	During the writing process, the students are not aware of the audience, have no clear purpose, are inadequate in explaining the subject, far from the type of writing, and weak in handwriting.
Level 2 (Improvable)	During the writing process, the students write without regard to the audience, have no clear purpose, are inadequate in explaining the subject, aware of the type of writing, but write by ignoring it, yet can handwrite.
Level 3 (Competent)	During the writing process, the students are aware of the audience, able to write in accordance with the topic in terms of scientific writing, have a clear purpose of writing, are aware of the type of writing, and can handwrite in a clear and understandable manner.
Level 4 (Very Competent)	During the writing process, the students are aware of the audience, able to write in accordance with the topic in terms of scientific writing by giving examples and explanations, have a clear purpose of writing, write in compliance with the type of writing, and can handwrite in a clear and understandable manner using a unique approach.

### The Application Procedure

The application procedure was conducted in the unit called, “Either Independence or Death” in the 8<sup>th</sup> grade course- the Turkish Republic, History of Revolution and Atatürk’s Principles. The application lasted for a total of 4 weeks, with 2 lessons per week both in the experimental and control groups. In the experimental group, the lessons were taught using writing-to-learn activities, and in the control group, according to the current curriculum (as suggested by the Ministry of National Education [MoNE]). The application process is presented in Figure 3.



**Figure 3.** The application procedure

With the aim of fulfilling the implementation process in a planned manner in the control and experimental groups, weekly lesson plans were prepared by the researchers including the topics and achievements of the relevant unit. Later, after being informed about the purpose of the study, the students in the experimental and control groups were given the AAT and SRWS as pre-tests. After the pre-tests, the teaching process started for the relevant unit in both groups, in compliance with the lesson plans prepared. All stages of the implementation process in this study were carried out by the researchers. The course processes of the experimental and control groups are described in detail below.

### The Course Process in the Experimental Group

The writing-to-learn model developed by Hand and Prain (2002, p.743) was used to improve the academic achievement and self-regulation skills of the students in the experimental group. A variety of writing-to-learn activities were developed by the researchers, taking into account the basic principles of the model used. The activities and their basic structure are given in Figure 4.

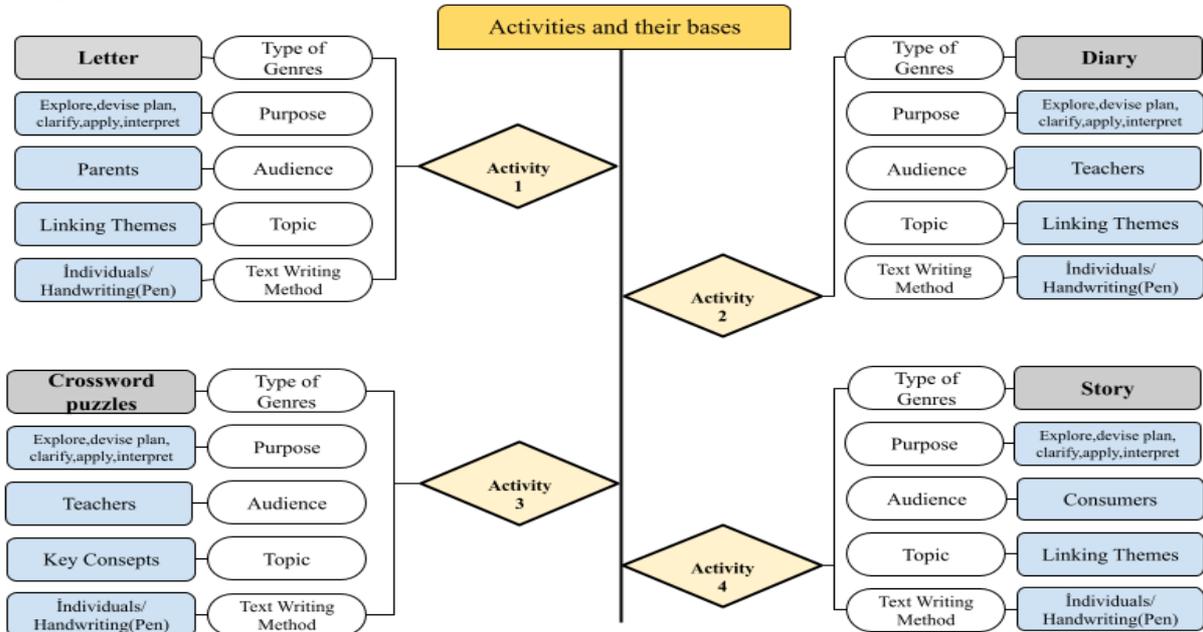


Figure 4. Writing-to-learn activities and their basic structure

As previously mentioned, the students in the experimental group were taught 2 hours per week for 4 weeks through the activities prepared in accordance with the expected achievements of the relevant unit and in line with the basic components specified in Figure 4. The application process carried out in the experimental group is presented in Figure 5 in detail.



**Figure 5.** The application procedure in the experimental group

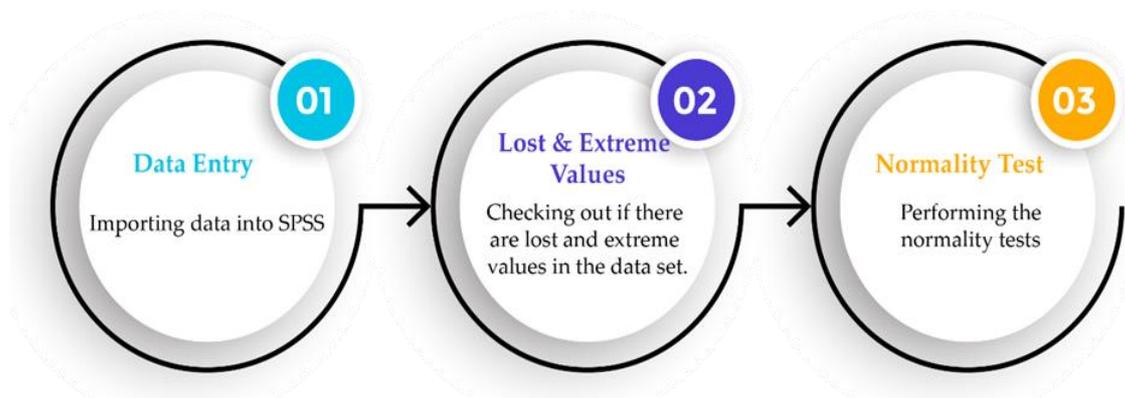
An example of a writing-to-learn activity prepared by the students in the experimental group is presented in Appendix 1.

### ***The Course Process in the Control Group***

The relevant unit in the control group was taught by adhering to the existing program. The students were explained the topics by the teacher of the course in the CG, and were asked some questions, to which answers were received. The students were asked whether there was any part that they did not understand, and necessary clarifications were made, if any. Later, the relevant assessment questions were studied with the students to finalize the chapter. Students were asked to prepare for the next topic. The related subjects were taught in the same way every week, and the unit was completed.

## Data Analysis

Figure 6 presents the data analysis process in detail.



**Figure 6.** Data analysis process

Upon generating the data set, normality analysis was performed to decide which parametric or nonparametric tests were to be used according to the relevant research questions. The Kolmogorov Smirnov test was used for normality analysis since the number of students was over 30 in the control and experimental groups (Can, 2017; Karaatlı, 2017). For normality analysis, histogram, normal Q-Q plot, detrended normal Q-Q plot graph, kurtosis and skewness values were examined, in addition to whether the data showed normal distribution or not (Tabachnick & Fidell, 2015; Pallant, 2005). As a result of the normality test, the independent groups *t*-test was chosen from among the parametric tests. Before the *t* test analysis, utmost attention was paid in an attempt to ensure the normal distribution required for the analysis, the equality of the variances of the groups, and each data being independent from the other.

Taking into consideration the objectives, research questions, and the design of the study, the following tools were used in the data analysis of the research:

- Independent groups *t* test was used to explore whether there was a statistical significance between the academic achievements of the students in the control group and the experimental group in terms of the pre-test and post-test results.
- Independent groups *t* test was used to determine whether there was a significant difference between the self-regulation-based writing skills of the students in the experimental and control groups in terms of pre-test and post-test results.
- A holistic assessment rubric was used to determine the writing-to-learn levels of students in the experimental group.

The effect size value was calculated in order to determine how effective the application was after the independent groups *t* test. Generally, an effect size value of 0.2 is considered as a small effect, 0.5 as a medium effect, and 0.8 as a large effect (Green & Salkind, 2005; Can, 2017). Those values were taken into account for the effect size in this study.

## Results

### Results Related to the Levels of Writing-to-Learn Ability

The students were asked to carry out some writing-to-learn activities (writing letters, diaries, stories, and doing crossword puzzles) in order to determine their capacity regarding the writing-to-learn ability. Table 3 and Figure 7 show the students' writing-to-learn levels observed during the application procedure.

**Table 3.** Students' Level of Writing-to-Learn Ability During the Application

Week	Activity	Level 1 (f)	Level 2 (f)	Level 3 (f)	Level 4 (f)
Week 1	Letter-writing	10	13	7	1
Week 2	Diary-writing	3	14	7	7
Week 3	Doing crossword puzzles	3	1	15	12
Week 4	Story-writing	0	3	12	16



**Figure 7.** The levels of students' writing-to-learn ability

Table 3 and Figure 7 show that the level of writing proficiency was at Level 1 ( $f = 10$ ) and Level 2 ( $f = 13$ ) in the first week of the application procedure, while mostly at Level 2 ( $f = 14$ ) in the second week, mostly at Level 3 ( $f=15$ ) in the third week, and mostly at Level 4 in the fourth week ( $f = 16$ ). More specifically, in the first week's activity (letter-writing), the students were able to handwrite only, without being aware of the audience or paying attention to the type of writing in terms of the writing-to-learn model. In addition, what was written by the students seemed to be inadequate in explaining the topic covered. In the second week's activity (diary-writing), the students showed some progress compared to the first week to such an extent that they became aware of the audience and type of writing but continued to write independently of the type and the audience. In addition, the students were still inadequate in writing in accordance with the topic and purpose. In the third week's activity (doing crossword puzzles), the students were aware of the audience and able to write in accordance with the topic in terms of scientific writing. Also, the students reached the level of writing with being aware of the purpose of writing in a clear and understandable handwriting in accordance with the type of writing. In the fourth week's activity (story-writing), the students were aware of the audience, able to write according to the topic in terms of scientific writing by giving examples and explanations. Also, the students had a clear purpose of writing, wrote in compliance with the type of writing, and could handwrite in a clear and understandable manner using a unique approach. In this sense, it can be assumed that the students' levels of writing-to-learn ability

increased in the process. In other words, as the experimental group students were involved in the activities used in the learning processes, they demonstrated progress in writing in accordance with the basic principles of writing-to-learn model (purpose, topic, audience, text production method, type of writing).

### ***The Results of the Academic Achievement Test***

In an attempt to detect the influence of activities used for the purpose of the writing-to-learn model on academic achievement, the students in the experimental and control groups were administered the Academic Achievement Test (AAT) in the form a pre-test and post-test. Table 4 and Table 5 show the results of the independent groups *t* test analysis and descriptive statistical analysis conducted to determine whether writing-to-learn activities had a remarkable influence on students' academic achievements.

**Table 4.** The Results of the Descriptive Statistics and Independent Groups *t* Test regarding the Pre-test Data of the AAT

AAB	Groups	N	$\bar{X}$	Ss	sd	T	P
Pretest	EG	31	48.55	8.86	62	-.472	.639
	CG	33	49.55	8.03			

The descriptive statistics of the data obtained from the pre-test of AAT presented in Table 4 show that the mean scores of the students in the experimental and control groups (EG;  $\bar{X}$  = 48.55; CG;  $\bar{X}$  = 49.55) were close to each other. Table 4 also presents that there was no statistically significant difference between the groups in terms of academic achievement ( $t(62) = -.472, p > 0.05$ ). In this case, it can be assumed that the academic achievement of the students in the experimental and control groups was close to each other before the application started.

Table 5 shows the results of the descriptive statistical analysis and the independent groups *t* test analysis of the data obtained from AAT given to the experimental and control groups as a post-test.

**Table 5.** The Results of the Descriptive Statistics and Independent Groups *t* Test regarding the Post-test Data of the AAT

AAT	Groups	N	$\bar{X}$	Ss	sd	T	P
Post-test	EG	31	82.26	13.89	62	2.444	.017
	CG	33	71.82	19.59			

According to the data obtained from the AAT (Table 5) given as a post-test after the application, the mean scores of the students in the experimental group (EG;  $\bar{X}$  = 82.26) were higher than those of the students in the control group (CG;  $\bar{X}$  = 71.82). Table 5 presents that the difference between the averages was found to be statistically significant ( $t(62) = 2.444, p < 0.05$ ). The effect size value calculated as a result of the analysis was  $d = 0.61$ , indicating a medium level effect.

### ***The Results of Self-Regulation Scale for Writing***

In an attempt to find out the extent to which the writing-to-learn model influenced students with respect to self-regulation skills in writing, the Self-Regulation Scale for Writing (SRSW) was used in the experimental and control groups as a pre-test and post-test. Table 6

and Table 7 present the independent groups *t* test and descriptive statistical analysis results to determine whether or not writing-to-learn activities bring about a remarkable impact on students' self-regulation skills in writing.

**Table 6.** The Results of the Descriptive Statistics and Independent Groups *t*-Test regarding the Pre-test Data of the SRSW

Scale	Sub-dimensions	Groups	N	$\bar{X}$	Ss	sd	t	P
of Scale of Self-Regulation for Writing	Monitoring the Process	EG	31	20.74	4.35	62	-1.054	.296
		CG	33	21.82	3.81			
	Seeking Help	EG	31	17.19	4.60	62	-.482	.631
		CG	33	17.70	3.72			
	Generating Ideas	EG	31	13.65	3.66	62	-.628	.532
		CG	33	14.24	3.92			
	Showing Effort	EG	31	19.97	5.89	62	.166	.868
		CG	33	19.73	5.66			
SRSW (General)	All Dimensions	EG	31	71.55	13.77	62	-.581	.563
		CG	33	73.48	12.88			

Table 6 shows that there is no statistical significance among the pre-test scores related to the sub-dimensions (monitoring the process, seeking help, generating ideas, showing effort,  $p > 0.05$ ) of the SRSW. Table 4 shows that the mean scores of the students in the experimental and control groups (EG;  $\bar{X} = 71.55$ ; CG;  $\bar{X} = 73.48$ ) were close to each other, and there was no statistical significance between the groups in terms of pre-test scores about the self-regulation skills in writing ( $t(62) = -.581, p > 0.05$ ).

The descriptive statistical analysis results of the data obtained from the SRSW applied to the experimental and control groups as a post-test, and the results of independent groups *t* test analysis are presented in Table 7.

**Table 7.** The Results of the Descriptive Statistics and Independent Groups *t* Test regarding the Post-test Data of the SRSW

Scale	Sub-dimensions	Groups	N	$\bar{X}$	Ss	sd	T	P
of Scale of Self-Regulation for Writing	Monitoring the Process	EG	31	23.35	2.67	62	3.400	.001
		CG	33	20.51	3.85			
	Seeking Help	EG	31	20.48	1.87	62	5.903	.000
		CG	33	16.60	3.17			
	Generating Ideas	EG	31	15.16	2.55	62	-.341	.734
		CG	33	15.39	2.87			
	Showing Effort	EG	31	21.87	3.32	62	1.043	.301
		CG	33	20.81	4.60			
SRSW (General)	All Dimensions	EG	31	80.87	6.88	62	4.326	.000
		CG	33	73.33	7.03			

Table 7 shows a statistical significance between the post-test mean scores of the sub-dimensions of the SRSW- “monitoring the process” and “seeking help” ( $p < 0.05$ ). The effect size value was calculated as  $d = 0.85$  for the sub-dimension of monitoring the process, and  $d = 1.48$  for seeking help, indicating a significant effect. No statistical significance was determined between the post-test mean scores of the sub-dimensions of “generating ideas” and “showing effort” ( $p > 0.05$ ). According to the data related to the whole SRSW (all dimensions) applied to the experimental and control groups as a post-test (Table 7), the mean scores of the students in the

experimental group (DG;  $\bar{X} = 80.87$ ) were higher than those of the students in the control group (CG;  $\bar{X} = 73.33$ ), and the difference between the mean scores was found to be statistically significant ( $t(62) = 4.326$ ,  $p < 0.05$ ). The effect size value calculated as a result of the analysis was  $d = 1.08$ , indicating a significant effect.

## Discussion

The present study investigated how the activities for the purpose of the writing-to-learn model used in the course named the Turkish Republic, History of Revolution and Atatürk's Principles influence academic achievement of students and their self-regulation skills in writing. The first result was that the levels of writing-to-learn ability of the students in the experimental group, who were taught in accordance with the writing-to-learn activities, were found to have developed over time. The second result in parallel with this development showed that the academic achievement level of the students in the experimental group was remarkably higher than the level of the students in the control group, who were taught based on the current curriculum. The results of this study were found to be in conformity with the results of the studies in the literature on the writing-to-learn model (Alharbi, 2015; Ashworth, 1992; Ay & Başbüyük, 2018; Caukin, 2010; Ellis-Robinson, 2015; Hohenshell & Hand, 2006; Hand, Yang & Bruxvoort, 2007; Karaçağıl, 2014; Kayalp & Şimşek, 2020; Kieft, Rijlaarsdam & Bergh, 2006; Klein, Piacente-Cimini & Williams, 2007; Klein & Rose, 2010; Noel, 1996; Ray-Parsons, 2011; Noel, 1996; Tynjala, 1998; Uzoğlu, 2014a; Yasul, 2019). The desirable outcomes obtained through writing-to-learn model as found in the literature and in this study have also been encountered in the meta-analysis studies on the writing-to-learn method (Graham, Kihura & Mackay, 2020) and trends in the studies conducted on this model (Klein & Boscolo, 2016). The fact that teaching through writing-to-learn activities generated an outcome in favour of the students in the experimental group with respect to the level of academic achievement can be attributed to a variety of reasons. The students in the experimental group not only created the written texts in the form of letters, diaries, crossword puzzles and stories out of what they learned, but they also expressed the topics in an original style of writing after the processes of concentrating on and thinking about the topic, organizing information, reasoning on the topic to be written about, reviewing and evaluating the written activity in the letter- and story-writing activity; cognitive awareness, recollection, and detailed explanation in the diary-writing activity; and researching, understanding and comprehension in the crossword puzzle activity. Such processes enabled the students in the experimental group to learn the subject better and show a higher success than those in the control group. Some common features were found when the reasons for such a result were examined through the studies in the literature. Writing-to-learn activities, which play an important role in the integration of previous information and new information, (Emig, 1977) provide the opportunity for students to learn more by making it possible that the topic is expressed in a different writing form (Günel, Hand & Prain, 2007). Students who are able to think, reason and organize their ideas on the content in the learning process through writing go through a more effective learning experience (Applebee, 1984; Bereiter & Scardamalia, 1987). Writing-to-learn activities that involve students in the writing process rather than the plain representation of knowledge (Yore, Bisanz & Hand, 2003) give students the opportunity to concentrate on the content and concepts learned (Hand, et al., 2007), and to think and question in a more complex manner (Langer & Applebee, 2007). Thanks to these opportunities, students engaged in writing activities seem to be aware of what they are writing. This awareness is thought to contribute to better learning of any content (Hebert, Simpson & Graham, 2013).

Like many researchers, Yeşildağ-Hasançebi et al. (2017) attributed the extent of the influence

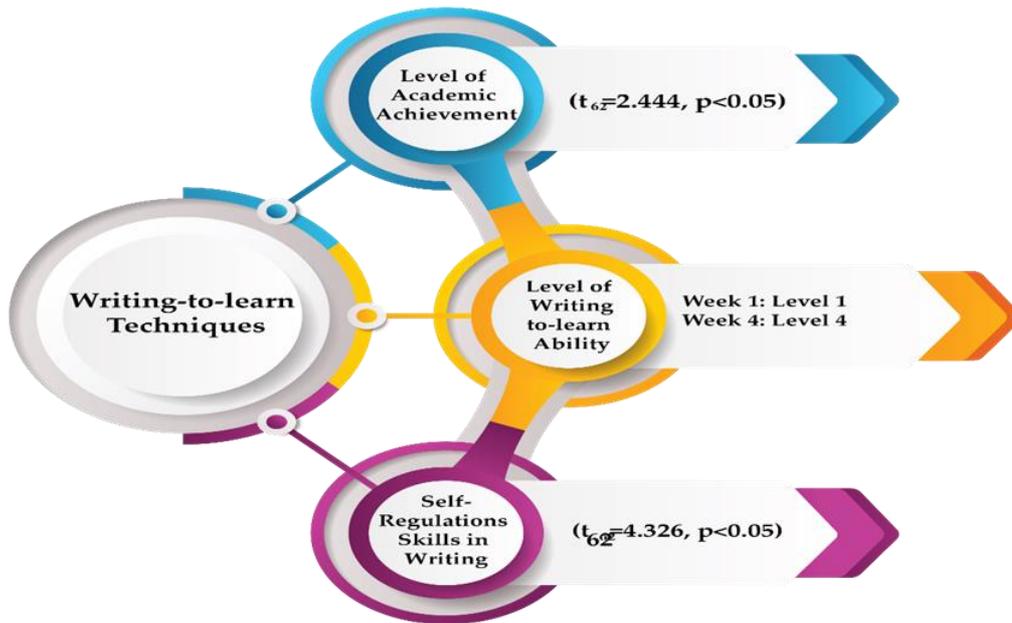
on learning outcomes in relation to writing-to-learn activities to the capacity of such activities to lead students to do research, to enable them to produce unique products and to encourage students to in-depth studying. Alharbi (2015) pointed out that the students who take an active role in planning, reviewing, organizing and evaluating writing during the writing process of writing-to-learn activities improve their capabilities of understanding and comprehension, which all provide more effective learning, while, on the other hand, Thompson, Pilgrim and Oliver (2005) emphasized that writing activities direct students to deep learning that provides understanding of content, concepts and ideas rather than superficial learning based on memorizing the information obtained. Hohenshell and Hand (2006) indicated that writing-to-learn activities lead students to different ways of thinking, resulting in a positive effect on learning. Expressing that writing-to-learn activities are effective in the development of thoughts on the subject, Tynjala (1998) also added that in the thinking process, students who produce new information in a different form by processing the existing information can have the opportunity to remember what is learned more easily, thereby providing effective learning. Students' ability to remember information more easily is attributed to the fact that writing about the content learned, as stated by Silva and Limongi (2019), combines information in the long-term memory and facilitates learning. Using the Science Writing Heuristic (SWH) one of the writing-to-learn types, Hand, Wallace, and Yang (2004) emphasized that writing-to-learn activities improve students' understanding towards scientific research and increase their cognitive awareness, which is effective on learning. Burke, et al., (2006), on the other hand, pointed out that activities such as research, gathering information on the subject, and explaining the opinions in learning processes create a suitable learning atmosphere for students. It can be assumed that the reasons underlying the academic achievement of the students in the experimental group of the study and those of the studies in the literature turn out to be similar.

Another result of the research revealed that the students in the experimental group had higher self-regulation skills in writing than those of the students in the control group. It could be assumed that the difference arising between the experimental group and the control group is caused by the act of writing, which forms the basis of writing-to-learn activities. The related literature shows that although different models and applications based on writing are used in studies on self-regulation and writing, all such models result in increasing students' success and performance in writing (Çağlayan-Dilber, 2014; Finlayson & McCrudden, 2019; Glaser & Brunstein, 2007; Reynolds & Perin, 2009; Sperger, 2010; Tracy, Reid & Graham, 2009; Uygun, 2012; Zumbrum, 2010), and develop a positive attitude in students towards writing (Harris, et al., 2002; Uygun, 2012). In addition to being at the centre of the writing-to-learn activities, writing also constitutes the core of whole learning processes and contributes positively to self-regulation skills in writing (Englert, Raphael & Anderson, 1992; Fisher, 2012; Graham, et al., 1991; Harris, Graham & Mason, 2006; Müldür, 2017; Özbay, 2008; Sawyer, Graham & Harris, 1992; Uygun, 2012; Zumbrunn, 2010), generating similar results with this study. Researchers who possess the common view that self-regulation is an important component of writing competence (Graham & Harris, 2000; Zimmerman & Risemberg, 1997) base this conclusion on a number of reasons. Since writing is a complex process (Harris & Graham, 2016; McCutchen, 2000), goal setting (Bruning & Horn, 2000), monitoring and controlling the process will provide qualified writing (Graham & Harris, 2000). Planning is also of great importance. It is the self-regulation skill of the individual to make a plan by determining the purpose of writing (Zimmerman & Kitsantas, 2007). Indeed, an individual who makes a good planning can achieve writing well (Butler, Elaschuk, Poole & 2000). In this respect, different models and approaches used in teaching how to write encourage the use of self-regulation strategies such as planning, reviewing, and organizing the text (Harris & Graham, 1996). When considered in terms of writing-to-learn activities, which include different processes such as

planning, researching, thinking, reviewing, and assessing, it can be assumed that this study meets at a common point with other studies examining the influence of writing-to-learn activities regarding the development of self-regulation skills of students.

### Conclusion and Suggestions

With the aim of finding out the how writing-to-learn activities may impact students' performance in the Turkish Republic, History of Revolution and Atatürk's Principles course, the present study investigated the writing-to-learn model, which has become an alternative teaching method in different fields from social sciences to life sciences, in terms of their influence on students' academic achievement and self-regulation skills in writing in the Turkish Republic, History of Revolution and Atatürk's Principles course. The first result obtained from the research is that writing-to-learn activities employed in the Turkish Republic, History of Revolution and Atatürk's Principles course provide a significant improvement in students' levels of writing-to-learn ability. The second result of the study is the significant difference in students' academic achievement levels. And the third result is a significant change in students' self-regulation skills in writing thanks to writing-to-learn activities. Figure 8 illustrates the results of the writing-to-learn activities used in the Turkish Republic, History of Revolution and Atatürk's Principles course.



**Figure 8.** Conclusion of the research

Considering the positive effects of writing-to-learn activities in the Turkish Republic, History of Revolution and Atatürk's Principles course as in different teaching domains, the following suggestions can be made:

- Writing-to-learn activities used in this study revealed a positive impact on students' academic achievement and self-regulation skills in writing in the Turkish Republic, History of Revolution and Atatürk's Principles course. This positive result can also be achieved by writing-to-learn activities in different courses.

- The present study included a number of students in the 8<sup>th</sup> grade only. Similar studies can be conducted at different grade levels.
- In this study, letters, diaries, puzzles, and stories were used from among writing-to-learn activities. Similar studies can be conducted with different writing-to-learn activities.
- While this study revealed the impact of writing-to-learn model on academic achievement in the Turkish Republic, History of Revolution and Atatürk's Principles course, it did not evaluate the permanence of the obtained information. The impact of the model on permanence can also be observed in future studies.

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## Appendix 1. A Sample Work of the Students in the Experimental Group

Öğrenme Amaçlı Yazma Etkinlik -1-

**CEPHEDEN MEKTUP**

Doğu Cephesi'nde görev yapan bir askersiniz. Ailenizden çok uzaktasınız. Doğu Cephesi'nde yaşadıklarınızı ailenize mektup yazarak anlatmak istiyorsunuz. Savaş ortamında zaman buldukça savaşta tüm gelişmeleri mektupla ailenize anlatıyorsunuz.

The student is aware of the audience, that is, who they are writing to.

Aileniz Doğu Cephesi'nde yaşanan o zorlu günleri sizin yazacağınız mektuptan öğrenecektir. Konu ile ilgili öğrendiklerimizden yola çıkarak ailemize bir mektup yazalım.

Canım annem ve benimle birlikte ailem,  
Doğu cephesinde asker yapıyorum. Avrupa'da  
Ermenilerle mücadele ediyoruz. Komutanımız da  
Komutanımız Kazım Karabekir. Çok sevdiğim odu.  
Hep birlikte canını feda etmek için savaş  
Kazım Karabekir komutasındaki Türk ordusu Kars, Batum ve  
Gümüşhane'ye ele geçirdi. Ermenileri mağlup ettik ve onlar da anlaşma  
imzalamak zorunda kaldılar. 3 Aralık 1918'de Gümüşhane'yi  
imzalandı. Sizlere anlaşmanın şartlarından bahsediyim.  
-Kars Sarıkamış katliamı ve Ladir Türkleri gibi katliamlar  
-Tamm'in meclisimiz ve Ermeniler arasındaki sorunlar  
-Kars katliamını anlatmak.  
-Tamm'in yeni meclisimiz  
Askeri, siyasi başarıları oldu. Ermeniler misakimilliyet şartları  
ilk devlet serri anlaşmasını red etti ve bunun yeni sıra meclisimizi  
tayan ilk devlet oldu. Buradaki asker birlikleri Berlin'de da  
göstermesi için Batı cephesine kaydırıldı. Maatte böyle sergiledi  
qilem. Eee beni bilverin sizler ne düşünürsünüz. Umarım. Ya  
bakarsanız ki bu ama bu dönemde Kiler askerlik yapıyor ne  
ilâhî deyim. Neyle neyse bir gelişme olursa, size haber  
ederim yeni mektup yazırım. Canım ailem sizleri çok  
Sevdim. Sizleri çok seviyorum. Büyüklerin ellerinden  
kollarından geçirmenizi isterim. Herkesi çok sevinmişim  
Kendinizi çok çok düşünün. Bakın. Görünmek dileğiyle...  
Asker Kizimden Sevgiler

The student is able to convey scientific information appropriate to the subject, make explanations and give relevant examples.

The student is able to convey information with his/her own expressions by handwriting.

The student is aware of the purpose of writing and able to write in accordance with this purpose.

The student is aware of the type of writing-to-learn activity and able to write suitable for this type.