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The Role of Writing-to-Learn Method in Teaching About Natural Disasters and Environmental Issues: A Mixed Methods Study

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Abstract

This study aims to examine the impact of writing-to-learn approach on teaching about natural disasters and environmental issues contained in the Social Studies course, by adopting a mixed methods research approach. It includes a total of 51 fifth graders for whom various writing-to-learn activities (i.e. writing interviews, poetry, diaries, letters, columns, and newspaper articles) were used during a Social Studies course to provide opportunities for both cognitive and affective learning. The activities were evaluated in the process to give the students necessary feedback. Research data were collected through an academic achievement test, a self-evaluation form, a semi-structured interview form, and a structured classroom observation form. Qualitative data were analysed by content analysis and quantitative data by descriptive and predictive statistics. The results revealed a statistical significance in favour of the experimental group students who were instructed through writing-to-learn activities regarding natural disasters and environmental issues. It appeared that writing-to-learn activities included in the learning process acted as a lever for students while learning, and eased their learning load. The source of the cognitive and affective difference seems to have resulted from such factors as thinking over the subject learned during writing-to-learn activities, transferring what one thinks to the interlocutor by using specific expressions unique to social studies, making mental efforts to transform the information into a different form, being aware of one's own learning level and making up for the lack of knowledge through feedback. Social studies educat.

Keywords: Environmental issues, natural disasters, social studies course, writing-to-learn.

Introduction

With globalization, humanity has not only reached different and versatile possibilities but also faced unprecedented problems (Sözen, 2021). These problems may stem from a social context, as well as from nature and the environment (Demirkaya, 2016). The problems resulting from natural disasters and from other environmental issues are all among the most indubitable problems faced by the world in the 21st century (Yılar & Şimşek, 2021). This reality indicates that besides the increasing loss of life and property as a result of natural disasters, billions of dollars of economic loss has also occurred (Şengün & Küçükşen, 2019). While more than 10 thousand people lost their lives due to natural disasters on a global scale in 2021, a total of 101.8 million people were affected by natural disasters on the whole. The economic damage caused by such natural disasters reached approximately \$252.1 million (Centre for Research on the Epidemiology of Disaster [CREDE], 2021). Besides that, the world has been facing with different environmental issues (air, soil, noise, water, and global warming) that have been on the rise in the last fifty years (Çepni & Aksoy, 2016). Both the problems caused by natural disasters and the multiple effects of environmental issues have led the whole world to enter a great struggle (Akengin, 2018). Policymakers seeking solutions to natural disasters and environmental issues try to form the basis of a scope of struggle through many different institutions and organizations regarding these problems (Kaypak, 2014). In this sense, educational institutions are at the forefront of the fields that countries are focused on in an effort to build them well (Gökçe, 2009). In order to raise awareness to achieve sustainable development, many countries update their education programs or curricula in such a way as to cover natural disasters and environmental issues. Being aware of this necessity, the Turkish Ministry of National Education has included the course named Environmental Education and Climate Change into its secondary school curriculum (Ministry of National Education [MEB], 2022). As a matter of fact, the topic of natural disasters and

environmental issues, which are considered among the top common and fundamental problems of the world, has become one of the most essential subjects of the lifelong learning process, rather than being stuck in a certain period of education life (Williams, 2005). Countries with this awareness have adopted an approach towards lifelong environmental citizenship (Georgiou et al., 2021).

Today, building a capacity for people to react to a natural disaster, to be knowledgeable about it, and to develop necessary attitude and behaviour that will contribute to making analyses and coming to conclusions (Sözcü & Aydınöz, 2019), to gain basic consciousness, awareness and understanding in the face of environmental issues (Karaçayır, 2022) is deemed absolutely necessary. From this standpoint, education programs play a critical role in meeting this requirement. One of the curricula to undertake this task is the social studies course (Aktepe & Temur, 2018). In this connection, one of the most fundamental aims of the social studies course is to “*raise individuals who are aware of the limitations of the natural environment and resources, and are trying to protect natural resources with environmental awareness and understanding towards a sustainable environment*” (MEB, 2018, p.8). As concrete indicators of this aim, what is tried to be built through the social studies course is the capacity to enable individuals i) *to question the causes of natural disasters and environmental issues in the environment, ii) to explain the effects of natural disasters on social life with examples* (MEB, 2018, p.18), and iii) *to take the necessary measures in the face of natural disasters* (MEB, 2018, p.15), in a visible manner. It is of great importance to be knowledgeable about natural disasters and environmental issues, and to have sound information about their causes and consequences, both in preventing natural disasters that may be encountered and in eliminating environmental issues. For this reason, educational approaches that promote innovative processes to lead students to research, invention, and discovery should be included in the teaching of these subjects, rather than just teaching through reading and explaining (Gülersoy et al., 2020). In the same manner, educators at all levels need to adopt relevant practices that will ultimately lead students to a greater success (Kayaalp & Şimşek, 2021). Research has shown that a variety of materials and teaching techniques such as *simulation-based teaching* (Şahan & Dinç, 2021), *digital games* (Doğan & Koç, 2017), *drama* (Karataş, 2011), *infographics* (Karaçayır, 2022), *educational comics* (Topkaya & Doğan, 2019), *Six Thinking Hats* technique (Şeyihoğlu & Kartal, 2018), *cartoons* (Karakuş et al., 2012), *documentaries* (Uçar & Karakuş, 2017), *newspapers* (Gökçe, 2009), and *augmented reality supported games* (Wang et al., 2021) have been in use for many years to teach about natural disasters and environmental issues. Another pedagogical approach to be used as an alternative to these methods and techniques employed for teaching about natural disasters and environmental issues, which also includes both cognitive and affective learning processes, is the “*writing-to-learn*” model.

Writing-to-Learn Pedagogy

Writing-to-learn pedagogy (Nelson, 2001), which adopts the characteristics of constructivist theory and draws attention to the productive nature of human knowledge and communication, has been regarded as a tool for improving learning by many researchers since the 1970s (Bangert-Drowns et al., 2004). Describing writing as a unique way of learning, Emig (1977) paved the way for the writing-to-learn model to become an important pedagogical approach. Over time, this beginning has formed the basis for the understanding of the cognitive processes behind

writing (Bereiter & Scardamalia, 1987; Flower & Hayes, 1981) and the socio-cultural processes that include socialization in the writing process (Gere et al., 2019), thereby further deepening the pedagogy of writing-to-learn. Despite this depth, writing, which is associated with concepts such as grammar, syntax and rhetoric, could be perceived as a prescriptive structure by students (Otfinowski & Silva-Opps, 2015). Contrary to stereotyped perceptions, writing-to-learn, which gives students a flexible and liberating understanding, does not actually aim to learn how to write (Kayaalp & Şimşek, 2020). The underlying reason for this is that while learning to write, what are prevailing in the process are the concerns about grammar, spelling and sentence structure; however, in the writing-to-learn model, it is essential to focus on the learning content, not on the writing skills themselves (Myers, 1984). Considering this principle, researchers have made a number of definitions that draw attention to different aspects of writing-to-learn over time (Kayaalp & Şimşek, 2020). Zinsler (1988) described writing-to-learn as a pedagogical approach that involves reasoning on a topic and writing to clarify what has been learned about that topic so as to facilitate learning. Taking the writing process into consideration from a different perspective, Yuliyani et al., (2021), described writing-to-learn as a pedagogical way that allows students to make connections between the information they have learned during the lesson and their learning styles. According to Baaijen and Galbraith (2018), writing-to-learn is the conscious structuring of existing information to produce a new product rather than transferring existing information in one's memory into a text. Given the definitions shared in the literature, it is necessary to develop an understanding rather than rhetorical goals as a priority in the pedagogy of writing-to-learn. It is also essential that students discover their own understanding of the subject learned, rather than how to write appropriately in a disciplined manner (Rivard, 1994). Just like reading, writing is the basis of academic learning at different learning levels (Phillips & Norris, 2009) and supports the development processes of students (Rouse et al., 2021). Writing-to-learn, which attracts students' attention and functions as a catalyst for learning and creating meaning (Knipper & Duggan, 2011, p. 462), does not steal time from teaching, on the contrary, it improves the teaching content and encourages students to think and synthesize the information comprised in the content (Myers, 1984). Similarly, writing-to-learn activities that enable deep learning (Gunel et al., 2009) are likely to widen the thinking process as well as deepening the understanding (Knipper & Duggan, 2011). The primary purpose of writing-to-learn activities is, therefore, to engage students in a cognitive activity that activates higher-order thinking skills for learning (Boscolo & Mason, 2001).

Although the pedagogy of writing-to-learn, which is based on the belief that writing about a subject or concept will help students understand and learn, (Fry & Willagomez, 2012) is generally considered as a tool of learning (Arnold et al., 2017), it has multiple contributions to students in different aspects (Kayaalp et al., 2022). Research has shown that the process of writing-to-learn has proven efficacious in the development of students' *critical thinking skills* (Yuliyani et al., 2022), *self-regulation skills* (Nückles et al., 2020), *academic achievement* (Kim et al., 2021), *communication skills* (Sintiawati et al., 2021), *deep learning* (Gupte et al., 2021), *epistemological beliefs* (Atasoy & Küçük, 2020), and *permanent learning* (Taşkın, 2021). Just like the case in various disciplines, it is possible to see these multiple effects of the pedagogy of writing-to-learn in the social studies course (İspir & Yıldız, 2021; Rouse et al., 2021). Given the outcome obtained from the writing-to-learn methodology in relation to social studies course as mentioned in the relevant literature, Walp (2013), for instance, tried to develop historical thinking

skills in the social studies lesson through writing-to-learn activities, while Noel (1996) benefited from this pedagogy in teaching history topics. Furthermore, while Klein and Rose (2010) focused on the effect on students' learning ability in social studies course, Dummer et al., (2008) incorporated the writing-to-learn model in the teaching process of geography subjects. In an attempt to integrate writing in the social studies course, Sielaff and Washburn (2015) also pointed out that writing is an effective tool in understanding or learning the content in the social studies course.

Significance and Rationale of the Present Study

Social studies course is a field of study that provides a direct correlation between the information learned and real life (e.g., the fifth grade subject matter, covering the issue of natural disasters and environmental issues fully constitute an example to this feature). In addition to this feature, the social studies course also incorporates a variety of skills (e.g., environmental literacy, critical thinking, and problem solving, etc.) and values (MEB, 2018). This comprehensive structure of the social studies course inevitably leads both teachers and researchers to turn to alternative teaching practices. Adopting the principles of constructivist theory, the writing-to-learn model (Nelson, 2001) is based on the premise that it can be a powerful strategy for learning any content (Myers, 1984). In this sense, the social studies course provides great opportunities for teachers to incorporate writing in their teaching practices (Abel et al., 1989). Having evaluated these opportunities through a metaphor, Maxim (1998) argued that writing is to social studies curriculum as the gym is to basketball. The prime cause of this study, which focuses on the topic of natural disasters and environmental issues in the social studies lesson, is *to examine whether the nature of the social studies lesson overlaps with the writing-to-learn pedagogy, and to provide teachers and researchers with a versatile viewpoint in regard to teaching the issue*. This study is believed to make an important contribution to the expected goals since it includes different data collection tools (observation form, self-evaluation form, semi-structured interview form) in the implementation process. The topic of natural disasters and environmental issues, which is included in the fifth grade social studies course, necessitates the emergence of cognitive change in the course of teaching in relation to such aspects as conceptualization, explanation, visualization, exemplification, in addition to affective and behavioural changes such as empathy, willingness, valuing, and transfer to life. The second reason for this study was *“to determine the role of writing-to-learn activities on cognitive and affective changes in students”* with respect to the topic of natural disasters and environmental issues. It is expected that different writing-to-learn activities (letter-writing, concept puzzle-making, interview-writing activities are expected to lead to cognitive change; poetry, column-writing and news article-writing activities to affective change; diary and column-writing activities to behavioural change) used in the implementation process are expected to play a mediating role in this change. Research has shown that a number of studies have been conducted with a focus on the cognitive background of the students about natural disasters (Karakuş, 2019; Tokcan & Yiter, 2017), on the views of different participants (students, pre-service teachers, and teachers) on natural disasters (Avcı, 2022; Bulut, 2020; Çelik & Gündoğdu, 2022; Dikmenli & Gafa, 2017; Kayaardı & Bozyiğit, 2022; Türksever, 2021), on the mention of natural disasters in social studies textbooks, disaster awareness, and education (Değirmenci et al., 2019; Karaca, 2022), and on natural disaster literacy (Demirdelen & Çakıcı, 2021; Sözcü & Aydınöz, 2019; Türker & Sözcü, 2021), however, despite being one of the most

fundamental problems of the current era, it is noteworthy that the number of studies that deal with the teaching of natural disasters and environmental issues on the basis of a student-centred approach remain insufficient to address the issue. The third reason for the emergence of this study, which integrates writing-to-learn with the topics of natural disasters and environmental issues, was *to incorporate an alternative approach to the teaching process of natural disasters and environmental issues*. It is expected that this study will contribute to the literature on both writing-to-learn and social studies.

Considering the contribution of the writing-to-learn model to the learning process, the research questions given below guided this study, based on the general framework of the topics of natural disasters and environmental issues:

- Is there a statistical significant difference between the students in the experimental and control groups in terms of academic achievement in the course of teaching the topics of natural disasters and environmental issues?
- What are the experiences of the experimental group students about the learning process enriched by writing-to-learn activities?
- What is the teacher' experience with the learning process supported by writing-to-learn activities?

Method

Research Design

This study was conducted using an embedded experimental design, which is one of the mixed research approaches. Creswell and Plano Clark (2007) classified the embedded pattern model as the embedded pattern, embedded experimental model and embedded correlational model, among which the embedded experimental model was used in the present study. Embedded experimental model, which is the most widely used type of the embedded design, involves embedding/integrating qualitative data into a real experiment or a quasi-experimental design. In the embedded experimental design, priority is determined by the experimental methodology, and qualitative data serve this methodology. This model can be used as a one-stage or two-stage approach, depending on the stage of incorporating qualitative data. As an example, in a one-stage approach, qualitative data can be embedded during the intervention or when a researcher wants to qualitatively examine the intervention process in addition to the quantitative results, while in a two-stage model, qualitative data can be embedded before or after the intervention (Creswell et al., 2003; Creswell et al., 2005; Creswell & Plano Clark, 2007; Sandelowski, 1996). Considering its structure and characteristics, the embedded experimental design was preferred in this study, in which an experimental process was designed first and then, the effect of the implementation process was determined and quantitative data obtained. However, qualitative data were collected during the experimental process (to determine the students' experiences with the process) and afterwards (to determine the teacher's experiences), in order to serve the quantitative data. Table 1 presents the procedures regarding the research process designed according to the embedded experimental design.

Table 1. Operations on the embedded experimental model

	Operations	Results
Before procedure		
	Administering the academic achievement test (pre-test) Observing the process Administering the academic achievement test (post-test) Students' self-evaluation of what they have learned.	Quantitative test results Qualitative results Comparison of quantitative test results and mean scores Calculation of self-assessment results
Qualitative Data Collection	Conducting interviews (Teacher-Students)	Qualitative results (codes & categories)
Integrating and Presenting QUANTITATIVE & Qualitative Data	Interpretation by integrating the QUANTITATIVE and qualitative results	Conclusion, Discussion and Recommendations

Study Sample

This study was conducted with a total of 51 fifth grade students studying in two different classrooms of a secondary school in the Ereğli district of Zonguldak, Türkiye in the 2021/22 academic year. The study sample was selected by using the convenient sampling method, which allows the conduct of a study by selecting a group as the subject on the basis of being easily accessible or suitable for the purpose (McMillan & Schumacher, 2014). In determining the study sample by using the appropriate sampling method, the fact that the teacher to be involved was knowledgeable about the writing-to-learn approach, and even had the title of science expert due to having conducted work on this approach, besides teaching two different 5th grade classes on the topic of natural disasters and environmental issues had been effective. One of the classes where the study was conducted was the experimental group in which the learning process was enhanced through writing-to-learn activities (Experimental Group [EG], n= 26), and the other was the control group with whom writing-to-learn activities were not conducted (Control Group [CG], n= 25). Table 2 presents demographic data about the study sample.

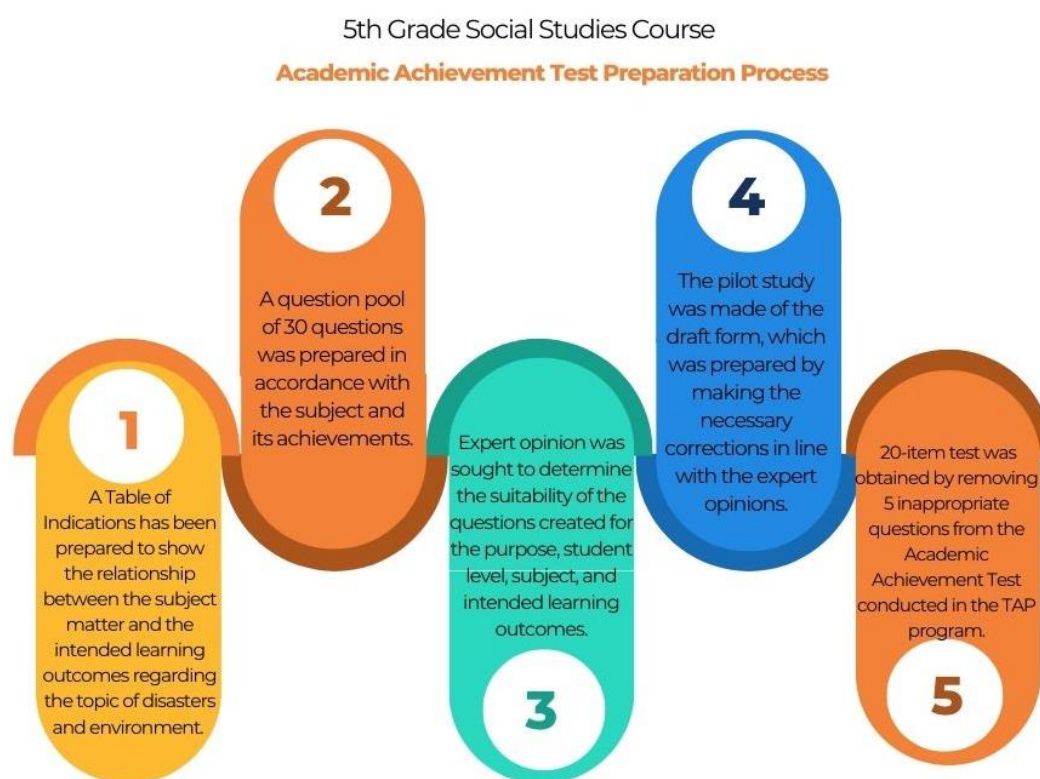
Table 2. Demographic data about the study sample

Groups	Gender	Frequency	Percentage (%)
EG	Male	12	46.15
	Female	14	53.85
CG	Male	10	40.00
	Female	15	60.00
Total		51	100

Data Collection Tools

Academic Achievement Test of Natural disasters and Environmental issues

“Academic Achievement Test” (AAT) was prepared by the researcher so as to determine the impact of writing-to-learn activities integrated into the teaching process of natural disasters and environmental issues on students’ extent of learning the subject matter. Figure 1 presents the preparation process of the academic achievement test as a whole.



Academic Achievement Test:

- -Kuder-Richardson-20 (KR20) reliability coefficient value: .81
- -Average difficulty index value: .54

Figure 1. Academic achievement test preparation process

Student Self-Assessment Form

A self-evaluation form on natural disasters and environmental issues was prepared by the researcher in order to determine the extent to which the students who were instructed on natural disasters and environmental issues through different writing-to-learn activities learned the subject matter or to reveal their views about their own learning levels. The self-evaluation form was filled by all students participating in the research process at the end of the relevant topic.

Structured Classroom Observation Form

The researcher prepared an in-class student observation form in order to evaluate the writing-to-learn activities integrated into the learning process of natural disasters and environmental issues in relation to their contribution to the learning process. The teacher observed all the activities conducted during the process and explained his experiences regarding the writing-to-learn activities through this form.

Semi-Structured Interview Form

In order to determine how the writing-to-learn activities impact the learned subject, a semi-structured interview form was prepared in such a way as to make it suitable for both the teacher and the students involved in the activities. Then, interviews were held with the teacher and students involved at the educational institution where the study was conducted. In this process, both the teacher and the students were informed that their identity information would be kept confidential, their names would be coded, and the data obtained would only be used within the scope of a scientific study.


Teaching Material Preparation Process


In the process of preparing the writing-to-learn activities integrated into the topics of natural disasters and environmental issues, different writing-to-learn activities were contained by the researcher in order for both the teacher and the students to carry out the activities effectively. To create the writing-to-learn activities, the writing process developed by Prain and Hand (1996, p. 618), consisting of five different components, was taken into account. In this model formed in such a way as to incorporate writing into the teaching process as a learning tool, it is essential that the information learned in the course is converted and transferred to friends, parents, teachers and computers (**addressees**) in the form of letters, diaries, poems, stories, etc. (**type of writing**) by handwriting or computer (**text production method**) through the connection between ideas and key concepts, etc. (**subject**) for the purpose of research, thinking, interpretation, and explanation, etc. (**goal**). Based on these basic components, examples of writing-to-learn activities prepared by the researcher for natural disasters and environmental issues are presented in Figure 2 below:


NATURAL DISASTERS
ACTIVITY 6

A News Article

Course: Social Studies
Grade: 5
Learning field: People, Places, and Environment
Topic: Environmental issues

 Ahmet came to class that morning very excited. In his hand was a brochure, advertising a newspaper article competition on environmental issues. This brochure caught his attention as he loved to read newspapers. But he didn't know how to write it. He asked his teacher, "Sir, how can I write an article in this newspaper?" he asked.



 After examining the brochure, social studies teacher, Engin said to his students: "Dear students, as we have learned in this week's topics, one of our most important responsibilities is protecting the environment. That's why I want you to create a remarkable newspaper article about environmental issues." He also presented a sample newspaper article to the students.

**Let's write a newspaper article about environmental problems.
Let's raise awareness and protect the environment.**

PEOPLE and ENVIRONMENT

ENVIRONMENTAL ISSUES

What's happening

How's people and nature

How will it affect life

Is there any way to prevent it?

P.S1: Please write the news article on the back page.
P.S2: You may add drawings or pictures.
P.S3: You may use the template given above while preparing the news article.

Figure 2. Examples of writing-to-learn activities

NATURAL DISASTERS
ACTIVITY 5

Let's Write Poetry

Course: Social Studies
Grade: 5
Öğrenme Alanı: People, Places, and Environments
Topic: What happened to us? Natural Disasters

A student at Grade 5, Metehan loves to write poetry. He writes a poem by using the concepts in the unit, 'Environment and Human beings' and reads this poem to his classmates in the social studies class. His classmates like the poem very much and say that they also want to write a poem on this subject.

Engin, the teacher, who cares about his students' desire to write poetry, prepares a poem template with the concepts of natural disasters and gives it to his students.

Let's talk about natural disasters

P.S1: You may use concepts other than those in the template.
P.S2: Please write the poem on the back page.

Figure 2. Examples of writing-to-learn activities (continuation-1)

Implementation

This study was completed in a total of 6 weeks in the form of 3 lesson hours per week in order to determine the impact of writing-to-learn activities in teaching the fifth grade unit of natural disasters and environmental issues. While the students were being instructed on the topics of natural disasters and environmental issues, the learning process was improved by preparing different writing-to-learn activities every week in accordance with the nature of the subject matter to be learned, in such a way that contributes to affective learning through pertinent activities such as interview-writing, letter-writing, news article-writing, and column-writing, since affective learning such as *"being aware and being sensitive"* was aimed as much as cognitive learning for the purpose of teaching the given topics. Some of the activities prepared by the researcher were applied directly in the classroom during the instruction phase of the subject, and some were given as homework. The activities prepared in written form by the students were evaluated by the teacher, who then provided them with feedback. The aim was to ensure that the

students were able to review what they had learned in the process and to identify the parts where they were strong or weak in the subject instructed. The writing-to-learn activities written at the desired level were shared with the students in the classroom. At the end of the instruction, a writing-to-learn activity, namely the concept puzzle, was included since it provided the opportunity to evaluate the learned topic as a whole. In this way, all the subjects instructed were reviewed as a whole. Finally, the implementation process was evaluated with the participation of the students and the process was completed. Table 3 presents the implementation process as a whole.

Table 3. *Implementation process*

The aim of the study, informing about the implementation process, and collecting pre-test data				
Weeks	Topic	Activity	Implementation method	Evaluation method
Week 2	Natural disasters	Interview-writing Letter-writing	Homework In-class	
Week 3	Natural disasters	Poetry-writing	In-class	
Week 4	Environmental issues	Diary-writing News-article writing Column-writing	Homework In-class Homework	Formative evaluation
Week 5	Environmental issues Natural disasters Environmental issues	Concept-puzzle writing	In-class	
Evaluation of the implementation procedure and collection of post-test data				

Data Analysis

Analysis of Academic Achievement Test

Following the academic achievement test specific to natural disasters and environmental issues, the data were transferred to SPSS, with the control and normality analysis performed on the data. Given the normal distribution of the data, equality of the variances of the groups and independence of each data from the other, *independent samples t-test* was conducted to determine whether or not there was a significant difference between the students' academic achievement in the experimental and control groups in terms of pre-test and post-test results.

Analysis of Self-Assessment Data

In order to reveal the extent of what they had learned on natural disasters and environmental issues, the students evaluated themselves in line with the statements in the self-evaluation form. At the evaluation stage, the students rated themselves concerning the relevant subject with the following rating items: 'Fully', 'partially', and 'very little'. The individual evaluations of the students were turned into a table to demonstrate the level of learning of the subject from a holistic perspective (Figure 3).

Analysis of Semi-Structured Interview Data

In order to determine the impact of the process carried out with writing-to-learn activities on learning, the opinions of both the teacher and the students were taken. First of all, all interviews were transcribed into plain texts, which were then analysed with content analysis methodology. In this process, students' opinions were analysed in the MAXQda 2020 qualitative data analysis

program, and the teacher's views were used to explain or complement the students' opinions. The students had been given codes (e.g., S1, S2...S26, etc.), when their opinions were presented. As a consequence, direct quotations were given from the answers given by the students and the teacher with the aim of making the themes and codes more understandable.

Analysis of In-Class Student Observation Data

Upon integrating writing-to-learn activities into the teaching process of natural disasters and environmental issues, the teacher observed the learning process through the structured observation form prepared by the researcher in order to determine how the writing-to-learn activities affected students' extent of learning. The comments made by the teacher were evaluated using a rating such as 'very strong', 'strong', and 'weak' based on the statements involved in the observation form. Observations made by the teacher regarding the role of writing-to-learn activities in the learning process are presented in a general framework (Figure 5).

Ethical Considerations

This study complied with all the rules specified to be followed within the scope of "Higher Education Institutions Scientific Research and Publication Ethics Directive". None of the actions specified under the title of "General Actions Contrary to Scientific Research and Publication Ethics", which is the second part of the directive, were executed.

Information about the Ethics Committee Approval

Name of the ethics review board = Zonguldak Bülent Ecevit University Human Research Ethics Committee

Date of ethics review decision = 30.11.2021

Ethics assessment certificate issue number = 25.11.2021/104913

Findings

Designed by adopting a mixed research approach, the present study first included quantitative results indicating how much the students were able to learn through writing-to-learn activities about natural disasters and environmental issues, and then qualitative results that explain why/how writing-to-learn activities were efficacious on learning. In order to determine the effect of writing-to-learn activities on the academic achievement of the students, the Academic Achievement Test (AAT) was administered as a pre-test and post-test to the students in the experimental and control groups. Table 4 and Table 5 present the analysis results of independent samples t-test and descriptive statistics analysis conducted to identify whether or not writing-to-learn activities had a statistically significant impact on students' academic achievement.

Table 4. *Descriptive statistics of AAT's pre-test data and independent samples t-test results*

AAT	Groups	N	\bar{X}	Ss	sd	t	p
Pre-test	EG	26	69.07	19.35	49	-.077	.93
	CG	25	69.44	13.65			

As seen in Table 4, the descriptive statistics results of the data obtained from the pre-test of the AAT revealed that the mean scores (EG; $\bar{X} = 69.07$; CG; $\bar{X} = 69.44$) of the students in the

experimental and control groups were close to each other with no statistically significant difference between the groups in terms of academic achievement ($t_{(49)} = -.077, p > 0.05$). With such results, the academic achievements of the students in the experimental and control groups before starting the application could be considered to have been close to each other.

Table 5 presents the descriptive statistical analysis results of the data obtained from the AAT, which was administered to the experimental and control groups as a post-test, and the independent samples t-test analysis results.

Table 5. Descriptive statistics of AAT's post-test data and independent samples t-test results

AAT	Groups	N	\bar{X}	Ss	sd	t	p
Post-test	EG	26	86.46	8.62	49	4.099	.00
	CG	25	75.68	10.12			

According to the data obtained from the AAT (Table 5), which was administered as a post-test to the experimental and control groups, the mean score of the students in the experimental group (EG; $\bar{X} = 86.46$) was found to be higher than that of the students in the control group (CG; $\bar{X} = 75.68$). As shown in Table 5, this difference between the mean values was found to be statistically significant ($t_{(49)} = 4.099, p < 0.05$). In other words, the use of writing-to-learn activities for teaching about natural disasters and environmental issues revealed a significant result in favour of the experimental group students.

It appeared that the learning environment enhanced with writing-to-learn activities yielded significant results in the students' academic achievement. However, it was also necessary to identify whether or not the students who directly participated in the teaching process instructed with writing-to-learn activities were aware of how much they had learned about natural disasters and environmental issues. Figure 3 below provides the results obtained from the self-assessment form used to determine students' cognitive awareness of disasters and environmental issues.

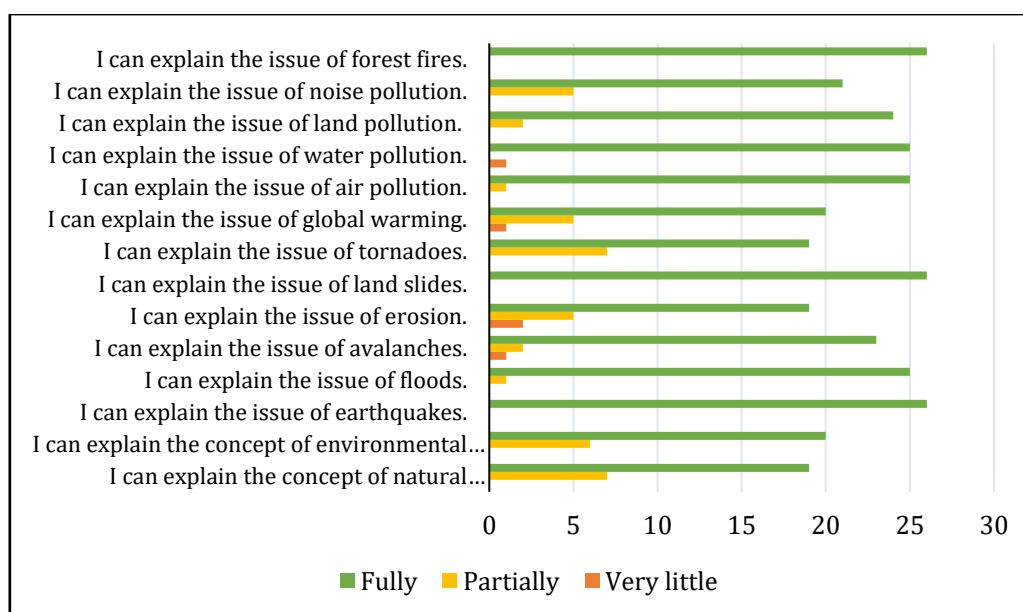


Figure 3. Students' self-assessment results

As can be seen in Figure 3, the students seemed to have learned about natural disasters such as earthquakes, floods, avalanches, and landslides, in particular, quite well, as well as the subject of tornadoes and erosion, though partially. Regarding the topic of environmental issues, while the students appeared to have learned about air pollution, water pollution, land pollution and forest fires very well, they turned out to have learned partially about noise pollution and global warming. The self-evaluation findings representing the students' their own individual learning levels on natural disasters and environmental issues as a whole (Figure 3) suggested that the writing-to-learn activities included in the learning process as a means of learning make significant contributions to the students' capacity of learning the subject matter.

In order to determine how writing-to-learn activities were effective on learning, interviews were conducted with both the students participating in the practice and the teacher who carried out the implementation of the study. The students' opinions were complemented with the explanations made by the teacher. Figure 4 illustrates the MAX Maps Code Co-occurrence Model of the findings obtained from student opinions on writing-to-learn activities.

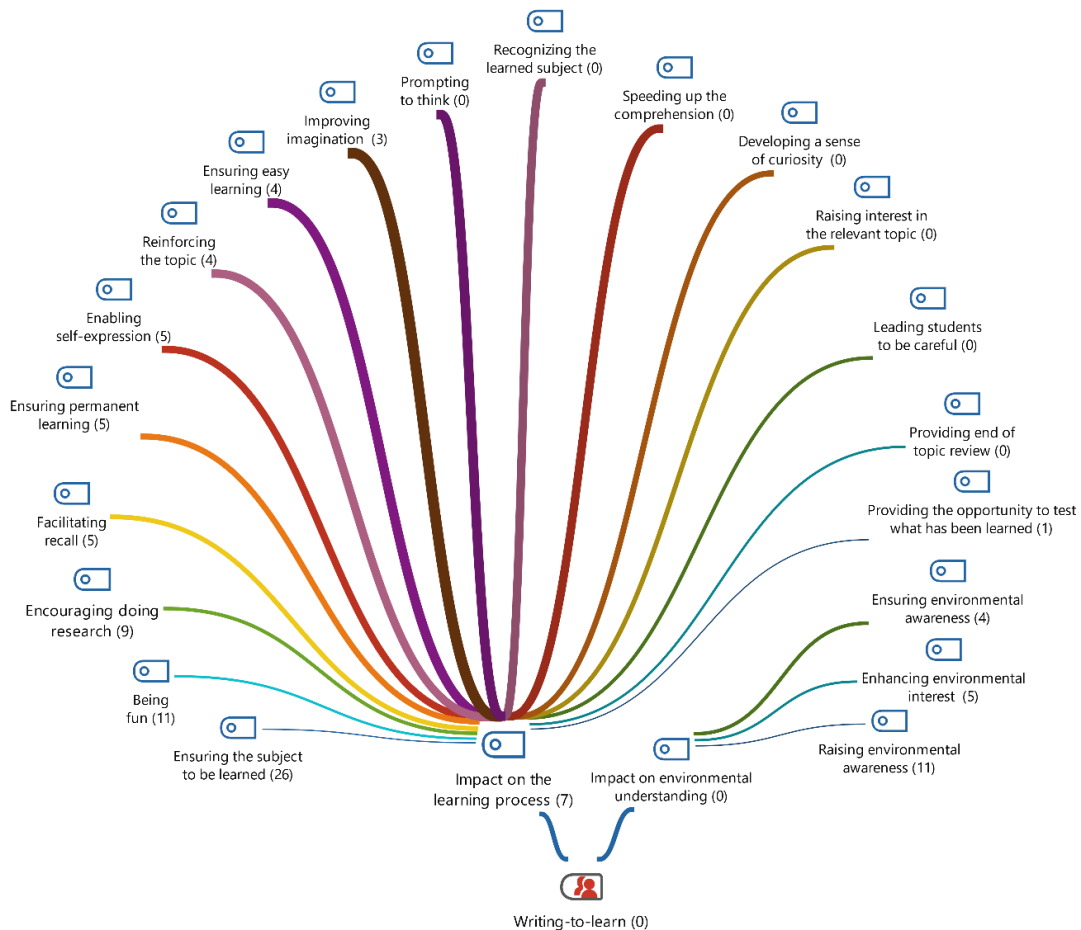


Figure 4. MAX maps code co-occurrence model for the writing-to-learn process

As can be seen in Figure 4, the students' views on the writing-to-learn activities included in the teaching process of natural disasters and environmental issues are grouped under two main themes as showing "impact on the learning process" and showing "impact on environmental comprehension". Evaluating these themes through quotations taken directly from students' opinions, it appeared that S7 addressed the effect of writing-to-learn activities on the learning

process based on the changes as a result of experience, saying: *"I think writing activities are a good way to keep things in mind. I like these activities because they are fun and make learning easier."* In the same manner, S8 said, *"These activities helped me understand the subject better. They also helped me review what I had forgotten and reinforce the topic"*, highlighting a different aspect of the writing-to-learn model. Pointing out the effect of writing-to-learn activities on permanent learning, S14 said, *"Spoken words fly away, written words remain. Writing activities are, therefore, important to me"*. About the writing-to-learn activities, which can be considered a mirror of how much students learn during the learning process, S12 said, *"The activities were helpful to me. I realized what I had learned wrong and what I had learned right, so that helped me reinforce the topic and learn more."* Emphasizing that writing-to-learn activities are the expression of feelings and thoughts, S13 explained this situation by stating that *"I think the activities we have written are very important because they are both fun and effective in expressing our feelings"*. Addressing to the writing-to-learn activities used as a learning tool, S16 said, *"Writing activities have many benefits. For example, sometimes I wrote things that I would never have thought of. While I was describing water pollution in a picture, I made the fish talk. It was so much fun. The activities have really been helpful for me to learn better"*, and suggested a clearer role for the writing-to-learn activities in the learning process.

Considering the change in the environmental understanding of the students who learned about natural disasters and environmental issues through writing-to-learn activities, S24 said: *"Frankly, at first, I thought that environmental issues or natural disasters were exaggerated, but after the activities, I understood the subject fully. I became more sensitive to natural disasters and environmental issues,"* underlining the personal change caused by writing-to-learn activities. Evaluating the awareness experienced in understanding the environment, S11 said, *"The activities we wrote were very helpful because they made me more aware of environmental issues and environmental pollution."* Experiencing a similar change, S17 said, *"After the activities we wrote, I became more sensitive to the environment. This made me happy. Writing activities allowed me to be more mindful of the environment than before"*. Mentioning about the subject learned through writing-to-learn activities, S12 said, *"I have become more sensitive to the environment and I want to research more. Thanks to writing activities, I loved doing research on the environment"*.

Given the effect of writing-to-learn activities on learning from the point of view of the teacher involved in the conduct of the study, it is noteworthy that the opinions expressed by the teacher about the writing-to-learn activities are very similar to those of the students. In this connection, the following views of the teacher turned out to overlap with those of the students in this study:

"Writing-to-learn activities allow students to organize what they have learned in their minds by adding their own feelings and thoughts to the learning process during the lesson, to develop their expression skills, to mature their perspective, to socialize by sharing their ideas with their friends, to develop their creativity as a result of exploring phenomena and facts with different tools, to ensure the learned information to be permanent due to their aroused interest in learning the subject and the process of learning itself, to make the lesson fun as a result of enriching it with different activities, to increase the interest of the students towards the lesson,

to awaken the desire to do research about different information on the subject thanks to the writing activities, and to develop positive attitude towards the lesson.”

In addition to these, the teacher, who compared learning activities with traditional classroom environments, added that, *“I believe that there will be big differences in terms of success and student behaviour between the classroom climate in which traditional teaching methods are used and the classes in which writing-to-learn activities are used”*. In fact, the teacher pointed out the fact that writing-to-learn activities should be widespread in learning environments by saying that, *“Besides being a great chance for students to use these activities in the classroom environment, I think, they should be used more extensively”*.

When the similarity in the views of students and teachers about writing-to-learn activities was handled in terms of student observations made by the teacher, it appeared that the observation results on writing-to-learn activities overlapped with the interview findings. Figure 5 presents the results of the student observations by the teacher regarding the writing-to-learn activities.

Evaluation Criteria	Very strong (3)	Strong (2)	Weak (1)
Writing-to-learn activities facilitate learning.	✓		
They allow students to think multi-dimensionally.	✓		
They encourage students to expose their creativity.	✓		
They enable students to recall easily.	✓		
They help students achieve permanent learning.	✓		
They provide students with different viewpoints.	✓		
They are considered as fun activities by students.	✓		
They are considered as boring activities by students.			✓
They ensure students' eager participation in the lesson.	✓		
They increase students' curiosity.	✓		
They attract students' attention.		✓	

Figure 5. Results of the student observation

The holistic evaluation of the student observation findings of the teacher regarding the contribution of writing-to-learn activities to the learning environment (Figure 5) show that writing-to-learn activities *facilitate learning, encourage multi-dimensional thinking, expose creativity, enable recalling, help permanent learning, provide a different perspective, offer an enjoyable environment, increase participation and curiosity* at a very strong level, whereas they turned out to be at a strong level in terms of *attracting students' attention*. Furthermore, the teacher also observed that the students *did not get bored* with the writing-to-learn activities.

As a result, it has been observed that writing-to-learn activities were effective in students' extent of learning about natural disasters and environmental issues, that student and teacher views on this process supported each other, and that the application procedure had a strong impact on students' learning about the given topic.

Discussion

This study examined the effect of writing-to-learn pedagogy on the teaching of natural disasters and environmental issues in the fifth grade social studies course. It was found that the teaching process, which was built on different writing-to-learn activities, provided significant changes in the students in the experimental group in relation to their extent of learning about natural disasters and the environmental issues (cognitive learning), as well as in their understanding of showing interest in the environment and developing more sensitivity (affective learning) (Table 5; Figure 3). Designed according to the embedded mixed methods model, this study obtained quantitative findings (academic achievement test and self-assessment form) on how effective writing-to-learn activities were on learning, while qualitative findings complemented the quantitative findings (teacher and student opinions and student observations) by clarifying the reasons for the effect of writing-to-learn activities on learning. The results of this study indicating the positive effects of writing-to-learn activities on students' learning are similar to those reported by a number of relevant studies in the literature (Ay & Başbüyük, 2018; Karaçagıl & Avaroğulları, 2017; Kayaalp et al., 2022; Şahin, 2019; Taşkın, 2021; Yasul, 2019). In fact, the results obtained at the end of the writing-to-learn activities signifying that they had led to significant changes in students' extent of learning in social studies course appeared to be in conformity with the findings of the meta-analysis study conducted by Graham et al. (2020), and they also overlapped with the research findings of Klein and Boscolo (2016), identifying general trends in research studies focusing on the writing-to-learn approach. The result of this study is in parallel with the conclusion that *writing-to-learn activities affect learning positively*, which has recently been reported by Chmarkh (2021) in the synthesis of experimental studies on the writing-to-learn model.

The efficacy of writing-to-learn activities in teaching the subject of natural disasters and environmental issues in the social studies course can be explained through many reasons identified during the implementation process of this study. The first of these reasons is that the writing-to-learn activities (interview-writing, news article-writing, column-writing, and poetry writing, etc.) included in this study allowed students to organize and control what they had learned, as well as resulting in mental planning about what was to be learned and monitoring the process. In this way, students seemed to become aware of their own thinking processes and achieve deeper learning. Evaluating this identified reason in a different way, Klein et al. (2018, p.163) stated that the students who engaged in cognitive and metacognitive strategies (i.e., mental regulation, supervision, planning and monitoring processes in the writing-to-learn process) in the writing process could achieve more learning. The second reason that writing-to-learn activities are considered efficacious in students' learning is that such activities provided students with the opportunity to take an active role in the process of knowledge reconstruction, thereby enabling the students to experience cognitive changes. To put it more clearly, interview writing, column writing and diary writing activities, which were given as homework in the teaching process of

natural disasters and environmental issues, seemed to have contributed to the students' capacity to develop their understanding of scientific research, gather information, explain the ideas in detail, use different ways of thinking and create original products; and likewise, the activities of writing letters, poems, and news articles, and preparing concept puzzles, especially in the classroom, provided opportunities for students to think, organize and combine their thoughts, reason on the subject, as well as exposing their imagination. In this process, the cognitive changes experienced by students while presenting the subjects of natural disasters (floods, earthquakes, avalanches, etc.) and environmental issues (water, air, soil pollution, etc.) that the students had learned / would learn in a different form (writing a diary, a poem, or a column) strengthen the quality of learning. With respect to the source of this power, Bereiter and Scardamalia (1987), for example, who made important contributions to the understanding of the relationship between writing and learning, pointed out that when provided with the opportunity to think, reason and organize their ideas on the content to be learned, students proved to have a more effective learning experience thanks to the writing used as a learning tool. In the same framework, Thompson et al. (2005) emphasized that writing activities lead students to deep learning, which provides a better understanding of the content, concepts and ideas related to the subject, rather than superficial learning based on memorizing the information obtained. Langer and Applebee (2007) attributed the source of this deep learning to the fact that the writing process allows students to focus on the learned content and concepts, to think more complexly and to question. Furthermore, Burke et al. (2006) suggested that activities such as doing research and gathering information about the subject, besides expressing their thoughts while learning are likely to enable students to experience learning in a more qualified setting. In a similar sense, having mentioned the importance of creating a writing-based product with a group rather than individual writing, Yılar and Şimşek (2017) pointed out that this unity among students led them to develop a mental organization. The mental change emphasized in the relevant literature was also apparent in the implementation process of the writing-to-learn activities in this study. The reasons reported in the literature and those identified in this study seem to be in compliance with each other.

Considered to be beyond the simple understanding of transferring information as it is learned (Yore et al., 2003), the writing-to-learn pedagogy establishes a third reason to be employed for the sake of improved learning due to its yielding significant results in favour of the experimental group students in the subject of natural disasters and environmental issues since the activities support the processes of learning, processing, and recalling the information. Focusing on the same reason, Tynjala (1998) stated that students who produce new information via different tools (i.e., there may be different writing-to-learn activities) by processing the available information are highly likely to have the opportunity to recall the subject learned more easily, as a result of which effective learning can take place. Similarly, Silva and Limongi (2019), who mentioned the relationship between writing and memory, drew attention to the fact that writing about the learned content facilitates learning by combining information in long-term memory. As stated by many researchers, this convenience is also evident in this study given the observations made by the teacher conducting the process and in the interviews with the students. In this connection, S7 said, *"I think writing activities are a good way to keep things in mind. I liked these activities because they are fun and facilitate learning"*, which could be considered as a statement to explain the reason for the statistical significance. Drawing on writing as a learning

tool as suggested by Emig (1977), this study focused on the process-based evaluation of the activities done by the students in the social studies course and provided the students with necessary feedback after each activity, constituting the fourth reason to achieve deep learning. The same reason seems to be compatible with the findings of many studies in the literature. As an example, Finkenstaedt-Quinn et al. (2020), who conducted their study on the concept teaching process through writing-to-learn activities, revealed that feedback provided as regards the activities and peer assessments were both effective in the learning process. Having made remarkable contributions to writing-to-learn pedagogy, Hand, Hohenshell, and Prain (2007) emphasized that “supplying support and feedback to students by the teacher during the production of the text” is an important element for students’ capacity to learn. In another study addressing this reason, Kayaalp et al. (2021) highlighted the strong link between writing, receiving feedback and learning in their action research study. In this context, it is evident that giving feedback for the activities carried out during the implementation process of writing-to-learn activities is of great importance to achieve high quality learning. The last reason that reveals the deep learning process in this study is the written language of the social studies or the language of the addressee, which was taken into account and designed accordingly while creating the writing-to-learn activities. In each activity in the present study, the text was created by considering a different addressee (teachers, friends, or consumers, etc.) as each addressee makes it necessary to use a different social studies language. As the social studies language used in accordance with the addressee changed, learning on the subject turned out to be deepened. Pointing to the same reason, Hand et al. (2007) stated in their study that deep learning occurred thanks to writing-to-learn activities. They attributed the reason for this situation to “creating a language capacity suitable for the addressee” as is the case in this study. Similarly, Gunel et al. (2009) stressed that the positive correlation between language and learning in the writing-to-learn process enabled learners to focus on the subject, to determine a framework, to think more about the subject, and thereby achieving a more qualified learning, all supporting the reasons specific to this study.

The curiosity and research motivation created by writing-to-learn activities in the learning process as well as the opportunities to enrich the imagination, encourage multi-dimensional thinking, enable learning by having fun, and manage the learning process in this study, in which writing-to-learn activities were employed in the establishment of the relationship between human, place and environment in the fifth grade social studies lesson, made it easier to learn about natural disasters such as floods, earthquakes, avalanches and landslides, and environmental issues such as water, soil and air pollution (Table 5). In addition to these, the activities (especially writing news articles, columns, and poetry) seemed to have affected the students emotionally and led them to be more responsible and conscious towards the environment (Figure 5). In order to reveal this cognitive and affective transformation supported by writing-to-learn activities in the implementation process as reported in the relevant literature, the study by Ay (2018) is notable in that it was conducted with fifth grade students for the purpose of instructing them about geography subjects with writing-to-learn activities (poetry and letter-writing), as a result of which the author concluded that the activities provided the students with the opportunity to understand the subject better and offered a learning setting with fun and different learning experience, which led to permanent learning similar to the results of the present study. Having examined the role of

writing-to-learn activities in the level of students' learning the subject content in the social studies lesson and their active participation in the learning process, Ellis-Robinson (2015) stated that the poetry writing activity, as a writing-to-learn activity, helped students to explain, summarize and transform the subject matter into an original product in such a way that resulted in deep learning. In another study that included writing-to-learn activities in the social studies course, Yasul (2019) conducted a study with fifth grade students with a focus on the relationship between science, technology and society with writing-to-learn activities, and stated that the activities enabled students to build knowledge and achieve deep learning, pointing to a conclusion that supports this study. In another recent study enhancing the teaching process of history topics through diary writing activities, Taşkın (2021) reported that, at the end of the process, students proved to have learned the subject more easily with the diaries they had written, that they achieved permanent learning, and that there was even a change in their attitudes towards the lesson. Both the results obtained and the reasons for the emergence of such results brought the two studies together at a common point. In a similar sense, Karaçağıl and Avaroğulları (2017), who integrated different writing-to-learn activities into the seventh grade social studies lesson, stated that thanks to the writing-to-learn activities, the students could grasp the subject matter more easily and look at it from multiple perspectives. Moreover, having conducted the teaching process of the social studies unit of 'Our Country and the World' in the sixth grade social studies course by making the students keep course diaries, Şahin (2019) reported that writing-to-learn activities offered an opportunity for deep and permanent learning in the social studies course. Yılar and Şimşek (2016) conducted a study focusing on cooperative teaching in the social studies course, pointing out that group writing activities were effective in the students' level of achievement. The holistic evaluation of the studies that have contributed to the learning-oriented literature in relation to the social studies course has shown that the writing-to-learn activities included in the teaching process in different subject areas at different grade levels by the use of writing-to-learn activities, whether being a single type of activity (only a poetry- or diary-writing activity) or multiple activities (letter-, fairy tale-, diary-writing, etc.), suggests that they benefit students in that the activities complement each other to result in deep learning.

Conclusion and Recommendations

Built on the basis of a mixed research approach concerning the question: "*Is it possible to achieve a cognitive and affective transformation through writing-to-learn activities in the social studies course?*", this study was executed by using writing-to-learn activities for teaching the topics of natural disasters and environmental issues, which can be the sources of both cognitive and affective changes. As a result of the study, it was determined with both quantitative and qualitative findings that the writing-to-learn activities included in the learning process of the topics of natural disasters and environmental issues contained in the fifth grade social studies course made a notable contribution to the students' extent of learning.

Considering this positive result, the positive classroom atmosphere observed during the teaching process and the opinions of teachers and students as a whole, it can be suggested that writing-to-learn activities help reduce the learning load of students, provide teachers with the opportunity to closely follow the learning process, and are suitable for the nature of the social

studies course. Based on the findings and results of the present study, the following suggestions can be made for future researchers and educators (teachers and academicians):

- This study was conducted in the fifth grade social studies course. Future studies can be similarly conducted at different grade levels.
- During the implementation, the nature of social studies and writing-to-learn pedagogy seemed to share similar characteristics. Further studies can be conducted to deeply explore this similarity.
- Even though this study mainly focused on cognitive learning, certain changes were identified in the affective learning of the students during the application process. Based on this situation, future studies can be conducted on the impact of writing-to-learn activities on affective learning.
- In this study, writing-to-learn activities proved efficacious on learning in a social studies course. Similar studies can be conducted in order to accomplish a more in-depth determination.
- This is a practice-based study, which provided significant results in students' learning. However, the use of writing for teaching purposes is not common in social studies. Future studies can be conducted to determine the meaning that teachers attribute to writing in the social studies course.

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There is no material or individual organic connection with the people or institutions involved in the research and there is no conflict of interest in the research



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Afetler ve Çevre Sorunları Konularının Öğretiminde Öğrenme Amaçlı Yazmanın Rolü: Karma Bir Araştırma

Giriş

Günümüzde insanların bir doğal afete karşı tepki vermesi, çözümleme ve sonuç çıkarmasına katkı verecek bilgi, tutum ve davranışlara sahip olması (Sözcü & Aydınöz, 2019) çevre sorunları karşısındaki temel bilinç, farkındalık ve anlayış kazanmaları (Karaçayır, 2022) gerekmektedir. Bu gerekliliğin sağlanmasında eğitim programlarına önemli işler düşmektedir. Bu görevi yüklenen öğretim programlarından birisi de sosyal bilgiler dersi (Aktepe & Temur, 2018). Nitekim sosyal bilgiler dersinin en temel amaçlarından birisi: “doğal çevrenin ve kaynakların sınırlılığının farkına varıp çevre duyarlılığı içerisinde doğal kaynakları korumaya çalışan ve sürdürülebilir bir çevre anlayışına sahip olan bir birey yetiştirmektedir” (MEB, 2018, s.8). Bu amacın somut göstergeleri sosyal bilgiler dersi üzerinden inşa edilmeye çalışılan i) yaşadığı çevredeki afetlerin ve çevre sorunlarının oluşum nedenlerini sorgulayan ii) doğal afetlerin toplum hayatı üzerine etkilerini örneklerle açıklayan (MEB, 2018, s.18) iii) doğal afetlere yönelik gerekli hazırlıkları yapan (MEB, 2018, s.15) bireyler üzerinden görünür kılınmaktadır. Doğal afetler ve çevre sorunları konusunda bilgili sahibi olmak, nedenleri ve sonuçları hakkında rasyonel bilgi edinmiş olmak gerek karşılaşılabilecek doğal afetleri önlemede gerekse çevre sorunlarını gidermede önem arz etmektedir. Bu nedenle bu konuların öğretimde sadece okuma ve anlatma esasından öte öğrencileri araştırmaya, buluş ve keşfe yönelten yenilikçi süreçleri içeren yaklaşımlara yer verilmelidir (Gülersoy vd., 2020). Yine her seviyedeki eğitimcilerin, öğrenciler için daha fazla başarı sağlayacak uygulamaları benimsemeleri gerekmektedir (Kayaalp & Şimşek, 2021). Bu anlayıştan hareketle alan yazın incelendiğinde; doğal afetler ve çevre sorunları konusunun öğretiminde *simülasyon öğretim yöntemi* (Şahan & Dinç, 2021), *dijital oyun* (Doğan & Koç, 2017), *drama tekniği* (Karataş, 2011), *infografikler* (Karaçayır, 2022), *eğitici çizgi roman* (Topkaya & Doğan, 2019), *altı şapka tekniği* (Şeyihoğlu & Kartal, 2018) *karikatür* (Karakuş

vd., 2012), *belgesel* (Uçar & Karakuş, 2017), *gazete* (Gökçe, 2009), *artırılmış gerçeklik destekli oyunlar* (Wang vd., 2021) gibi farklı materyal ve öğretim tekniklerin kullanıldığı görülmektedir. Gerek bilişsel gerekse duyuşsal öğrenme süreçlerini barındıran afetler ve çevre sorunları konularının öğretiminde kullanılan bu yöntem ve tekniklere alternatif olarak eklenebilecek farklı bir pedagojik yaklaşım da “*öğrenme amaçlı yazma*”dır.

Öğrenme Amaçlı Yazma Pedagojisi

İnsan bilgisinin ve iletişiminin üretken doğasına dikkat çeken yapılandırmacı teorinin (constructivist theory) niteliklerini benimseyen öğrenme amaçlı yazma pedagojisi (Nelson, 2001), 1970’lerden günümüze birçok araştırmacı tarafından öğrenmeyi geliştirmenin bir aracı olarak görülmüştür (Bangert-Drowns vd., 2004). Bu süreçte yazıyı öğrenmenin eşsiz bir yolu olarak nitelendiren Emig (1977), öğrenme amaçlı yazmanın pedagojik bir yaklaşım hüviyeti kazanmasının yolunu açmıştır. Bu başlangıç zamanla yazının arkasındaki bilişsel süreçlerin (Bereiter & Scardamalia, 1987; Flower & Hayes, 1981) yazma sürecine sosyalleşmeyi dahil eden sosyokültürel süreçlerin (Gere vd., 2019) anlaşılmasına kaynaklık etmiş böylece öğrenme amaçlı yazma pedagojisini daha da derinleştirmiştir.

Bir konu veya kavram hakkında yazmanın öğrencilerin anlamalarına ve öğrenmelerine yardımcı olacağı inancına dayanan öğrenme amaçlı yazma pedagojisi (Fry & Willagomez, 2012) genellikle öğrenmenin bir aracı olarak (Arnold vd., 2017) görünür olsa da öğrencilere çok yönlü katkıları söz konusudur (Kayaalp vd., 2022). Alan yazın incelendiğinde; öğrenme amaçlı yazma sürecinin öğrencilerin *eleştirel düşünme becerilerin* (Yuliyani vd., 2022), *öz düzenleme becerilerin* (Nückles vd., 2020), *akademik başarılarının* (Kim vd., 2021), *iletişim becerilerinin* (Sintiawati vd., 2021), *anlamli öğrenmelerinin* (Gupte vd., 2021), *epistemolojik inançlarının* (Atasoy & Küçük, 2020), *kalıcı öğrenmelerinin* (Taşkın, 2021) gelişiminde etkili olduğu tespit edilmiştir.

Sosyal bilgiler dersi, öğrenilen bilgiler ile gerçek yaşam arasında doğrudan bir bağıntı sağlayan (beşinci sınıf afetler ve çevre sorunları konusu bu özelliği tam anlamıyla karşılamaktadır) bir çalışma alanıdır. Bu özelliğinin yanında sosyal bilgiler dersi çok sayıda beceri (çevre okuryazarlığı, eleştirel düşünme, problem çözme) ve değerleri de bünyesinde toplamıştır (MEB, 2018). Sosyal bilgiler dersinin sahip olduğu bu kapsamlı yapı ister istemez hem öğretmen hem de araştırmacıları alternatif öğretim uygulamalarına yöneltmektedir. Yapılandırmacı teorinin ilkelerini benimseyen öğrenme amaçlı yazma pedagojisi (Nelson, 2001), içeriği öğrenmek için güçlü bir strateji olabileceği esasına dayanmaktadır (Myers, 1984). Sosyal bilgiler dersi afetler ve çevre sorunları konusu üzerine yapılan bu çalışmanın ilk gerekçesi *öğrenme amaçlı yazma pedagojisi ile sosyal bilgiler dersinin doğasının örtüşüp örtüşmediğini incelemek, öğretmen ve araştırmacılara çok yönlü bir bakış kazandırmaktır*. Odağına afetler ve çevre sorunları konusunu alan bu çalışmaya kaynaklık eden ikinci gerekçe “*öğrenme amaçlı yazma etkinliklerinin öğrencilerin bilişsel ve duyuşsal değişimlerdeki rolünü tespit etmektedir*”. Öğrenme amaçlı yazma ile afetler ve çevre sorunları konusunu bütünleştiren bu çalışmanın ortaya çıkma gerekçelerinden üçüncüsü ise *afetler ve çevre sorunları konularının öğretim sürecine alternatif bir yaklaşımı dahil etmektir*. Yapılan bu çalışmanın hem öğrenme amaçlı yazma hem de sosyal bilgiler alan yazınına katkı sağlaması beklenmektedir.

Öğrenme amaçlı yazmanın öğrenme sürecine olan katkıları afetler ve çevre sorunları konusunun genel yapısından hareketle bu çalışmaya aşağıda verilen araştırma soruları rehberlik etmiştir:

- Afetler ve çevre sorunları konusunun öğretim sürecinde akademik başarıları açısından deney ve kontrol grubundaki öğrenciler arasında anlamlı bir farklılık var mıdır?
- Deney grubu öğrencilerinin öğrenme amaçlı yazma etkinlikleriyle desteklenmiş öğrenme süreciyle ilgili deneyimleri nelerdir?
- Uygulama öğretmeninin öğrenme amaçlı yazma etkinlikleriyle desteklenmiş öğrenme süreciyle ilgili deneyimleri nelerdir?

Yöntem

Bu araştırma, karma araştırma yaklaşımları içerisinde yer alan gömülü deneysel desen modeliyle yürütülmüştür. Gömülü desenin en yaygın kullanılan modeli olan gömülü deneysel modelde, gerçek bir deney ya da yarı deneysel bir tasarımın içerisine nitel verilerin gömülmesi/entegre edilmesi söz konusudur (Creswell & Plano Clark 2007). Gömülü deneysel desende, öncelik deneysel metodoloji tarafından belirlenir ve nitel veriler bu metodolojiye hizmet eder. Bu model, nitel verileri dâhil etme aşamasına bağlı olarak tek aşamalı veya iki aşamalı bir yaklaşım olarak kullanılabilir. Gömülü deneysel modelin yapısı ve özelliğinden hareketle sosyal bilgiler dersinde afetler ve çevre sorunları konusunun öğretim sürecinde öğrenme amaçlı yazma pedagojisinin rolü nicel ve nitel veriler üzerinden açıklanmıştır.

Çalışma Grubu

Araştırma, 2021-2022 eğitim-öğretim yılında Zonguldak ili Ereğli ilçesinde yer alan bir ortaokulun iki farklı şubesinde öğrenim gören toplam 51 beşinci sınıf öğrencisi ile yürütülmüştür. Çalışma grubunun belirlenmesinde kolay erişilebilir veya amaca uygun olma temelinde bir grubun denek olarak seçilerek araştırmanın yürütülmesine imkân tanıyan uygun örnekleme yöntemi tercih edilmiştir (McMillan & Schumacher, 2014). Çalışmada uygun örneklem yönteminin tercih edilmesinde uygulama öğretmenin öğrenme amaçlı yazma konusunda bilgi sahibi olması (uygulama öğretmeni öğrenme amaçlı yazma üzerine yaptığı çalışma ile bilim uzmanı unvanına sahiptir) afetler ve çevre sorunları konusunun yer aldığı iki farklı 5. Sınıf şubesinin sosyal bilgiler dersini yürütmesi etkili olmuştur.

Veri Toplama Araçları

Afetler ve Çevre Sorunları Konusu Akademik Başarı Testi

Afetler ve çevre sorunları konusunun öğretim sürecine entegre edilen öğrenme amaçlı yazma etkinliklerinin öğrencilerin konuyu öğrenmeleri üzerindeki etkisini belirlemek için araştırmacı tarafından "Akademik Başarı Testi" (ABT) hazırlanmıştır.

Öğrenci Öz Değerlendirme Formu

Afetler ve çevre sorunları konusunu farklı öğrenme amaçlı yazma etkinlikleriyle öğrenen öğrencilerin ilgili konuyu ne kadar öğrendiklerini veya kendi öğrenme düzeyleri hakkındaki düşüncelerini belirlemek için araştırmacı tarafından afetler ve çevre sorunları konusuna yönelik öz değerlendirme formu hazırlanmıştır.

Yapılandırılmış Sınıf Gözlem Formu

Afetler ve çevre sorunları konusunun öğrenme sürecine entegre edilen öğrenme amaçlı yazma etkinliklerinin öğrenme sürecine olan katkılarını değerlendirmek için araştırmacı tarafından yapılandırılmış sınıf içi gözlem formu hazırlanmıştır. Uygulama öğretmeni süreç içerisinde yapılan tüm uygulamaları gözlemleyerek öğrenme amaçlı yazma etkinliklerine ilişkin deneyimlediklerini bu form üzerinden açıklamıştır.

Yarı Yapılandırılmış Görüşme Formu

Öğrenme amaçlı yazma etkinliklerinin öğrenilen konu üzerinde nasıl bir etki oluşturduğunu tespit etmek için hem uygulama öğretmeni hem de uygulama sürecine dahil olan öğrencilere uygun yarı yapılandırılmış görüşme formu hazırlanmıştır.

Öğretim Materyali Hazırlama Süreci

Afetler ve çevre sorunları konusuna entegre edilen öğrenme amaçlı yazma etkinlikleri hazırlanırken gerek uygulama öğretmenin gerekse öğrencilerin yapılan etkinlikleri etkili bir şekilde yürütebilmesi amacıyla araştırmacı tarafından farklı öğrenme amaçlı yazma etkinlikleri hazırlanmıştır. Öğrenme amaçlı yazma etkinlikleri oluşturulurken Prain ve Hand (1996, s. 618) tarafından geliştirilen ve beş farklı bileşenden oluşan yazma süreci dikkate alınmıştır. Yazıyı, öğrenmenin bir aracı olarak öğretim sürecine dahil eden bu modelde; ders içerisinde öğrenilen bilgiler düşünceler arası bağlantı veya anahtar kavramlar vb. (**konu**) ile araştırma, düşünme, yorumlama, açıklama vb. (**amaç**) amacıyla arkadaş, anne ve baba, öğretmen, tüketicilere (**muhatap**) el yazısı veya bilgisayar (**metin üretim metodu**) aracılığıyla mektup, günlük, şiir, hikaye vb. (**yazı türü**) şekline dönüştürüp aktarma esastır. Bu temel bileşenlerden hareketle afetler ve çevre sorunlarına yönelik araştırmacı tarafından farklı öğrenme amaçlı yazma etkinlikleri hazırlanmıştır.

Uygulama Süreci

Beşinci sınıf afetler ve çevre sorunları konusunun öğretiminde öğrenme amaçlı yazma etkinliklerinin etkisini belirlemek amacıyla yürütülen bu çalışma, haftalık 3 ders saati şeklinde toplam 6 haftada tamamlanmıştır. Afetler ve çevre sorunları konusu işlenirken öğrenilen konunun özelliğine uygun olarak (doğal afetler ve çevre sorunları konusunda bilişsel öğrenme kadar "bilinçlenmek, duyarlı olmak " gibi duyuşsal öğrenmeler de amaçlandığından bu amaca uygun röportaj, mektup, gazete haberi, köşe yazısı gibi duyuşsal öğrenmelere katkı sağlayan öğrenme amaçlı yazma etkinliklerine yer verilmiştir.) her hafta farklı öğrenme amaçlı yazma etkinlikleri hazırlanarak öğrencilerin öğrenme süreçleri desteklenmiştir. Araştırmacı tarafından hazırlanan etkinliklerin bazıları doğrudan konunun öğrenimi aşamasında sınıf içerisinde bazıları da ev ödevi şeklinde uygulanmıştır. Öğrenciler tarafından yazılan etkinlikler uygulama öğretmeni tarafından değerlendirilerek öğrencilere geri bildirimler sağlanmıştır. Böylece öğrencilerin süreç içerisinde öğrendiklerini gözden geçirme, öğrenilen konuya ilişkin güçlü oldukları veya zayıf kaldıkları bölümleri tespit etmeleri sağlanmıştır.

Verilerin Analizi

Akademik Başarı Testinin Analizi

Afetler ve çevre sorunları konusuna özgü akademik başarı testi uygulandıktan sonra deney ve kontrol grubunda yer alan öğrencilerin ön test ve son test sonuçları açısından akademik başarıları arasında anlamlı farklılık olup olmadığını belirlemek için *bağımsız gruplar t testi* yapılmıştır.

Öz Değerlendirme Verilerinin Analizi

Afetler ve çevre sorunları konusunda öğrenciler kendi öğrenme düzeylerini açığa çıkarmak amacıyla öz değerlendirme formunda yer alan ifadeler doğrultusunda kendilerini değerlendirmişlerdir. Değerlendirme aşamasında ilgili konuya ilişkin *“Tamamen, kısmen, çok az”* şeklinde bir derecelendirmeye yer verilmiştir.

Yarı Yapılandırılmış Görüşme Verilerinin Analizi

Öğrenme amaçlı yazma etkinlikleri ile yürütülen sürecin öğrenmeler üzerindeki etkisini belirlemek için hem uygulama öğretmenin hem de öğrencilerin görüşleri alınmıştır. Öncelikle yapılan tüm görüşmeler transkrip edilerek yazılı metinler haline getirilmiştir. Daha sonra bu yazılı metinler üzerinde içerik analizi yapılmıştır. Bu süreçte öğrenci görüşleri MAnQda 2020 nitel veri analiz programında çözümlenmiştir.

Sınıf İçi Gözlem Verilerinin Analizi

Uygulama öğretmeni afetler ve çevre sorunları konusunun öğretim sürecine öğrenme amaçlı yazma etkinliklerini entegre ettikten sonra öğrenme amaçlı yazma etkinliklerinin öğrencilerin öğrenmelerini nasıl etkilediğini tespit etmek için öğrenme sürecini araştırmacının hazırlamış olduğu yapılandırılmış gözlem formu üzerinden gözlemlemiştir. Uygulama öğretmeni yaptığı tespitleri gözlem formunda belirtilen ifadeler üzerinden *“Çok güçlü, güçlü, zayıf”* şeklinde bir derecelendirme kullanılarak değerlendirilmiştir.

Araştırmanın Etik İzinleri

Yapılan bu çalışmada “Yükseköğretim Kurumları Bilimsel Araştırma ve Yayın Etiği Yönergesi” kapsamında uyulması belirtilen tüm kurallara uyulmuştur. Yönergenin ikinci bölümü olan “Bilimsel Araştırma ve Yayın Etiğine Aykırı Eylemler” başlığı altında belirtilen eylemlerden hiçbiri gerçekleştirilmemiştir.

Etik Kurul İzin Bilgileri:

Etik değerlendirmeyi yapan kurul adı = Zonguldak Bülent Ecevit Üniversitesi İnsan Araştırmaları Etik Kurulu

Etik değerlendirme kararının tarihi=30.11.2021

Etik değerlendirme belgesi sayı numarası=25.11.2021/104913

Bulgular

Karma araştırma yaklaşımı benimsenerek dizayn edilen bu çalışmada, öncelikle öğrenme amaçlı yazma etkinliklerinin öğrencilerin afetler ve çevre sorunları konusunu ne kadar

öğrendiklerine gösterge olan nicel bulgulara daha sonra öğrenme amaçlı yazma etkinliklerinin öğrenmeler üzerinde niçin/nasıl etkili olduğunu açıklayan nitel bulgulara yer verilmiştir.

Öğrenme amaçlı yazma etkinliklerinin, öğrencilerin akademik başarıları üzerinde anlamlı bir etkisinin olup olmadığını tespit etmek amacıyla yapılan bağımsız gruplar t testi ön test analiz sonuçları ve betimsel istatistik analiz sonuçları Tablo 1’de sunulmuştur.

Tablo 1. ABT’nin ön test verilerine ilişkin betimsel istatistik ve bağımsız gruplar t testi sonuçları

ATB	Gruplar	N	\bar{X}	Ss	sd	t	p
Ön Test	DG	26	69,07	19,35	49	-,077	,93
	KG	25	69,44	13,65			

Tablo 1’de ABT’nin ön testinden elde edilen verilerin tanımlayıcı istatistikleri incelendiğinde, deney ve kontrol grubunda yer alan öğrencilerin puan ortalamalarının (DG; $\bar{X} = 69.07$; KG; $\bar{X} = 69.44$) birbirine yakın olduğu, akademik başarı açısından gruplar arasında istatistiksel olarak anlamlı bir farklılığın olmadığı tespit edilmiştir ($t_{(49)} = -.077$, $p > 0.05$). Bu durumda, uygulamaya başlamadan önce deney ve kontrol grubunda yer alan öğrencilerin akademik başarılarının birbirine yakın olduğu söylenebilir.

Deney ve kontrol gruplarına son test olarak uygulanan ABT’den elde edilen verilerin betimsel istatistik analiz sonuçları ve bağımsız gruplar t testi analiz sonuçları ise Tablo 2’de sunulmuştur.

Tablo 2. ABT’nin son test verilerine ilişkin betimsel istatistik ve bağımsız gruplar t testi sonuçları

ATB	Gruplar	N	\bar{X}	Ss	sd	t	p
Son Test	DG	26	86,46	8,62	49	4,099	,00
	KG	25	75,68	10,12			

Uygulama sonrasında deney ve kontrol gruplarına son test olarak uygulanan ABT’den elde edilen verilere (Tablo 2) göre, deney grubunda yer alan öğrencilerin puan ortalamalarının (DG; $\bar{X} = 86.46$) kontrol grubunda yer alan öğrencilerinin puan ortalamalarından (KG; $\bar{X} = 75.68$) daha yüksek olduğu görülmüştür. Tablo 2 incelendiğinde, ortalamalar arasındaki bu farklılığın istatistiksel olarak anlamlı olduğu tespit edilmiştir ($t_{(49)} = 4.099$, $p < 0.05$). Başka bir ifadeyle afetler ve çevre sorunları konularının öğretiminde kullanılan öğrenme amaçlı yazma etkinliklerinin deney grubu öğrencilerin lehine anlamlı bir sonuç ortaya çıkardığı görülmüştür.

Öğrenme amaçlı yazma etkinliklerinin öğrenmeler üzerinde nasıl etkili olduğunu tespit etmek için hem uygulamaya katılan öğrenciler hem de araştırmmanın uygulamasını yürüten öğretmen ile görüşmeler yapılmıştır. Öğrencilerin görüşleri öğretmen tarafından yapılan açıklamalar ile tamamlanmıştır. Bu doğrultuda gerek uygulama öğretmeni gerekse sürece dahil olan beşinci sınıf öğrencileri yapılan öğrenme amaçlı yazma etkinliklerinin afetler ve çevre sorunları konularının öğretiminde etkili olduğuna vurgu yapmışlardır. Öğrencilerin doğal afetler konusunda özellikle deprem, sel, çığ, heyelan gibi afetleri oldukça iyi; hortum ve erozyon konusunu ise kısmen öğrendikleri tespit edilmiştir. Çevre sorunları konusunda ise öğrencilerin hava kirliliği, su kirliliği, toprak kirliliği, orman yangınları konusunu oldukça iyi öğrenirken gürültü kirliliği ve küresel ısınma konusunda ise öğrenmelerin kısmen gerçekleştiği tespit edilmiştir. Öğrencilerin afetler ve çevre sorunları konusundaki bireysel öğrenme düzeylerini

yansıtıkları öz değerlendirme bulguları bir bütün olarak değerlendirildiğinde öğrenmenin bir aracı olarak afetler ve çevre sorunları konusunun öğrenme sürecine dahil edilen öğrenme amaçlı yazma etkinliklerinin öğrencilerin konuyu öğrenmelerine önemli katkılar sağladığı söylenebilir.

Öğrenme amaçlı yazma etkinliklerinin *öğrenmeyi kolaylaştırma, çok yönlü düşünme, yaratıcılığı açığa çıkarma, hatırlamaya imkan sağlama, kalıcı öğrenme, farklı bakış açısı sağlama, eğlenceli ortam sunma, katılımı ve merakı artırma* açısından çok güçlü düzeyde; öğrencilerin *ilgisini çekmede* güçlü düzeyde etkili olduğunu gözlemlemiştir. Yine uygulama öğretmeni öğrencilerin öğrenme amaçlı yazma etkinliklerinden *sıkılmadıklarını* da gözlemlemiştir. Sonuç olarak nicel ve nitel veriler bütünleştirilerek ele alındığında; öğrenme amaçlı yazma etkinliklerinin öğrencilerin afetler ve çevre sorunları konusunu öğrenmede etkili olduğu, bu sürece ilişkin öğrenci ve öğretmen görüşlerinin birbirini desteklediği, uygulama sürecinin öğrencilerin afetler ve çevre sorunları konusunu öğrenmeleri üzerinde güçlü bir etkiye sahip olduğu gözlemlenmiştir.

Tartışma ve Sonuç

Bu araştırmada beşinci sınıf sosyal bilgiler dersi içerisinde yer alan afetler ve çevre sorunları konusunun öğretiminde öğrenme amaçlı yazma pedagojisinin etkisi incelenmiştir. Farklı öğrenme amaçlı yazma etkinlikleri üzerinden inşa edilen öğretim süreci deney grubu öğrencilerin gerek afetler ve çevre konusunu öğrenmede (bilişsel öğrenme) gerekse çevreye karşı ilgi gösterme, daha fazla duyarlık kazanma anlayışlarında (duyuşsal öğrenme) anlamlı değişimler sağladığı tespit edilmiştir. Gömülü karma desene göre dizayn edilen bu çalışmada nicel bulgular (akademik başarı testi, öz değerlendirme formu) öğrenme amaçlı yazma etkinliklerinin öğrenmeler üzerinde ne düzeyde etkili olduğuna dair bir veri sağlarken nitel bulgular (Öğretmen ve öğrenci görüşleri, sınıf içi gözlemler) öğrenme amaçlı yazma etkinliklerinin öğrenme üzerindeki etkinin nedenlerine bir açıklık getirmiş, nicel bulguları tamamlamıştır. Öğrenme amaçlı yazma etkinliklerinin öğrencilerin öğrenmeleri üzerinde ortaya çıkardığı olumlu etki alan yazında yer farklı çalışmaların sonuçlarıyla benzerlik göstermektedir (Ay & Başbüyük, 2018; Karaçağl & Avaroğulları, 2017; Kayaalp vd., 2022; Şahin, 2019; Taşkın, 2021; Yasul, 2019). Hatta sosyal bilgiler dersinde öğrencilerin öğrenmelerinde anlamlı bir değişim sağlayan öğrenme amaçlı yazma etkinlikleri Graham vd., (2020) tarafından yapılan meta analiz çalışmasının bulguları ile paralellik gösterdiği gibi Klein ve Boscolo'nun (2016) öğrenme amaçlı yazma araştırmalarındaki genel eğilimleri belirlediği araştırma bulguları ile de örtüşmüştür. Yine bu çalışmanın sonucu ile yakın zamanda Chmarkh (2021) tarafından öğrenme amaçlı yazma üzerine yapılmış deneysel çalışmaların sentezine yansıyan "*öğrenme amaçlı yazma etkinlikleri öğrenmeleri olumlu etkilemektedir*" sonucu ile de paralellik göstermektedir. Ulaşılan bu olumlu sonuç, öğretim sürecinde gözlenen olumlu sınıf iklimi, öğretmen ve öğrenci düşünceleri bir bütün olarak değerlendirildiğinde; öğrenme amaçlı yazma etkinliklerinin öğrencilerin öğrenme yüklerini azalttığı, öğretmenlere öğrenme süreci yakından takip etme imkanı sağladığı, sosyal bilgiler dersinin doğasına uygun olduğu söylenebilir.