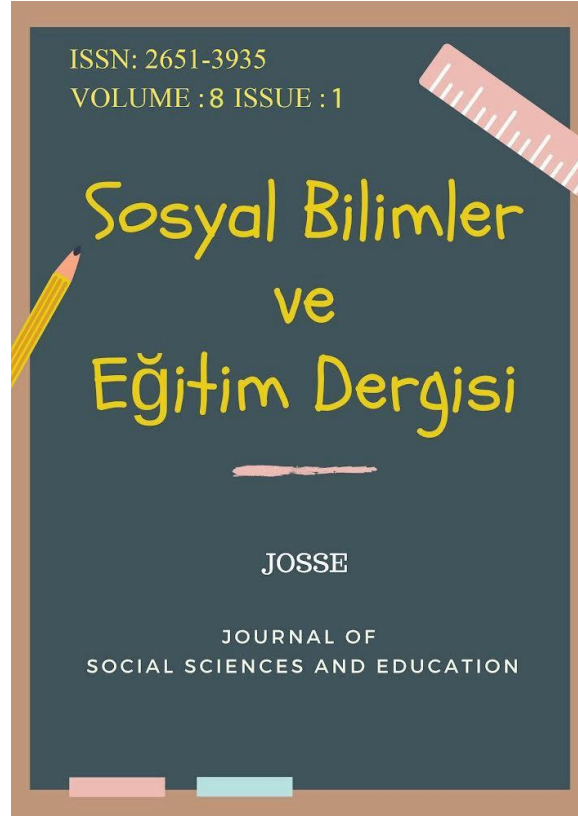


JOURNAL OF SOCIAL SCIENCES AND EDUCATION (JOSSE)



<https://dergipark.org.tr/tr/pub/josse>

Investigation of Social Studies Teachers' Naturel Disaster Literacy Levels in Terms of Various Variables (The Case of Ankara Province)

** This study was produced from the master's thesis titled "Investigation of Social Studies Teachers' Naturel Disaster Literacy Levels in Terms of Various Variables (The Case of Ankara Province)" conducted by the first author under the supervision of the second author.*

Adem KARACA¹

Ministry of National Education
Social Studies Teacher
ademkaraca_66@hotmail.com
Orcid ID: 0009-0005-6248-9125

Tevfik PALAZ²

Gazi University, Gazi Faculty of Education,
Department of Social Studies Education
Associate Professor Doctor
tevfikpalaz@gazi.edu.tr
Orcid ID: 0000-0002-1631-531X

Article Type: Research Article

Received: 18.05.2025

Accepted: 31.05.2025

Published online: 31.05.2025

Citation: Karaca, A., & Palaz, T. (2025). Investigation of social studies teachers' naturel disaster literacy levels in terms of various variables (the case of Ankara province). *Journal of Social Sciences and Education*, 8(1), 36-64.

Investigation of Social Studies Teachers' Naturel Disaster Literacy Levels in Terms of Various Variables (The Case of Ankara Province)*

Adem KARACA¹

Ministry of National Education

Tevfik PALAZ²

Gazi University, Gazi Faculty of Education, Department of Social Studies Education

Abstract

Research Article

The aim of this study is to examine the natural disaster literacy of social studies teachers from various perspectives. The study is designed using a quantitative research method and a survey model. The sample consists of 306 social studies teachers from in the central districts of Ankara. The data collection tool used in the research is the "Natural Disaster Literacy Questionnaire." The obtained data were statistically analyzed using the SPSS 22.00 software package. As a result of the study, it was found that social studies teachers' behaviors regarding natural disaster literacy and their affective tendencies are at a "Medium" level, while their achievement levels are at a "Very High" level. Additionally, those who are aware of their school's disaster plan, those who have participated in training related to natural disasters, and those who chose "Fire drill" among the activities they wish to participate in regarding natural disasters have higher levels of natural disaster literacy behavior. It was also determined that social studies teachers who are aware of their school's disaster plan have higher levels of affective tendencies regarding natural disaster literacy, and those who selected "Search and rescue" among the desired activities related to natural disasters have high achievement levels in natural disaster literacy. Emphasizing practical application in natural disaster training is important for increasing the levels of behavior and affective tendencies. Furthermore, it is essential for schools to assist social studies teachers in areas such as participating in disaster drills and being aware of their school's disaster plan, as this is necessary for creating awareness of disaster literacy.

Received: 18.05.2025

Accepted: 31.05.2025

Published online:

31.05.2025

Keywords: Social studies, social studies teachers, natural disaster, literacy.

* This study was produced from the master's thesis titled "Investigation of Social Studies Teachers' Naturel Disaster Literacy Levels in Terms of Various Variables (The Case of Ankara Province)" conducted by the first author under the supervision of the second author.

Corresponding author:

¹ Social Studies Teacher

ademkaraca_66@hotmail.com

Orcid ID: 0009-0005-6248-9125

² Associate Professor Doctor

tevfikpalaz@gazi.edu.tr

Orcid ID: 0000-0002-1631-531X

Introduction

Disaster can be defined as a natural event such as earthquake, tsunami, flood with a great potential for material and moral loss (Lathifa & Putra, 2022, p.1). All events that harm living things and their habitats are called disasters. If these events are caused by nature, they are called natural disasters (Dikmenli & Gafa, 2017, p.21). As in many countries, natural disasters such as earthquakes, floods, avalanches, droughts, landslides occur in Turkey. Especially with global warming, natural disasters have increased in recent years. As a result of these disasters, many living things are damaged.

The ability of a society to be protected from all kinds of disasters and to minimise the negative effects of disasters depends on the importance given by all segments of the society to have disaster awareness. Individuals forming the society feel ready and safe about disasters and this is realised by having disaster awareness. Therefore, in order to minimise the damages of disasters, disaster awareness must be created in the individuals forming the society and this can only be achieved through education. This awareness, which is very important for the development of disaster resilience, should be instilled from primary school children to all age levels of the society (Torlak, 2021, p.3). Considering that disaster awareness can be placed more firmly especially at young ages, the importance of disaster education for primary school students emerges. It is of great importance that teachers who will provide disaster education and raise disaster awareness among students have high disaster literacy levels. Teachers with high levels of disaster literacy will make significant contributions to the society in terms of raising disaster awareness in the society.

When the literature is examined, there are various studies on determining natural disaster literacy (NDL). Sözcü (2019) examined the NDL levels of prospective teachers, Demirdelen (2020) examined the NDL levels of primary/secondary school teachers working in Osmaniye city centre, Türker and Sözcü (2021) examined the NDL levels of prospective geography teachers, Uygun Seven (2022) examined the NDL levels of prospective science teachers, Üstündağ (2022) examined the NDL levels of special education teachers working in Bitlis province, Lathifa and Putra (2022) examined the NDL levels of Indonesian students, Vu et al. (2023) examined the NDL levels of Vietnamese high school students, and Logayah et al. (2023) examined the NDL levels of secondary school students. When the related literature was examined, no research was found to determine the natural disaster literacy status of social studies teachers. Social studies course is very important in terms of creating disaster awareness at a young age. In order to create disaster awareness, social studies teachers play a key role in

terms of transferring these subjects to students efficiently and establishing them as behaviours as well as including the relevant subjects in the textbooks. In this context, in order to fill this gap in the literature and to contribute to the related literature, this study focuses on determining the natural disaster literacy levels of social studies teachers. With this research, the NDL levels of social studies teachers working in schools were analysed in terms of various variables.

The main purpose of the research is to examine the current natural disaster literacy levels of social studies teachers in the central districts of Ankara province in terms of various variables. For this purpose, answers to the following questions were sought.

1. Is there a significant difference between social studies teachers' NDL behaviour levels and marital status, total years of employment, experiencing a disaster, receiving disaster education at university, knowing the school disaster plan, participating in a disaster-related activity, knowing the emergency gathering place, and the desired disaster-related activity?

2. Is there a significant difference between social studies teachers' NDL affective disposition levels and marital status, total working years, experiencing a disaster, receiving disaster education at university, knowing the school disaster plan, participating in a disaster-related activity, knowing the place of emergency gathering, and the desired disaster-related activity?

3. Is there a significant difference between social studies teachers' NDL achievement levels and marital status, total working years, experiencing a disaster, receiving disaster education at university, knowing the school disaster plan, participating in a disaster-related activity, knowing the emergency gathering place, and the desired disaster-related activity?

Method

Model

In this study, the natural disaster literacy levels of social studies teachers were examined according to various variables. The study was designed in quantitative research method and survey model. Quantitative research is a systematic method in which numerical data are collected by scientific methods and these data are subjected to statistical analyses and numerical data are produced (Tekindal, 2021, p. 175). The approach that tries to define a past or present situation as it is is called a survey model (Karaca, 2018, p. 111).

Sample and Population

The population of the study consists of 1357 social studies teachers working in secondary schools and imam hatip secondary schools in the central districts of Ankara province.

The process used to determine the sample is as follows (Yalçın, 2016, p. 65):

N: amount of individuals in the aggregate

n: amount of individuals in the sample

z: standard normal distribution table value for the desired level of reliability

d: sensitivity

p: proportion of individuals in the aggregate with the desired characteristic ($p+q=1$) z^2

Application of the formula:

n: sample size

$$n = \frac{N \cdot z^2 \cdot p \cdot q}{N \cdot d^2 + z^2 \cdot p \cdot q} \quad n = \frac{1357 \cdot (1,96)^2 \cdot (0,5) \cdot (0,5)}{1357 \cdot (0,05)^2 + (1,96)^2 \cdot (0,5) \cdot (0,5)} = 299$$

As a result of the sampling formula applied, it was found that 299 social studies teachers should be reached as the sample number representing the population. Ankara has 25 districts, 9 of which are central districts (Sincan, Çankaya, Etimesgut, Altındağ, Pursaklar, Keçiören, Gölbaşı, Mamak, Yenimahalle). A total of 306 social studies teachers working in secondary schools and imam hatip secondary schools in the central districts of Ankara were reached and all questionnaires were valid and included in the evaluation.

Data Collection Tool

The questionnaire titled “Determination of Natural Disaster Literacy Levels of Prospective Teachers” developed by Sözcü (2019) was used as a data collection instrument in the study. The questionnaire consists of four parts. The first part includes a personal information form consisting of 9 questions (Table 3). In the second part of the questionnaire, there is “Natural disaster literacy behaviour scale” (three factors; geographical questioning, personal protection measure and physical and intellectual approach) which consists of 23 questions and measures the behaviours of the participants against natural disasters. According to the reliability analysis results of this scale, “reliability score is 0.88”. In the third part of the questionnaire, there is the “Natural disaster literacy affective disposition scale” (three factors; sensitivity, awareness, individual and social preparedness) which consists of 25 questions and measures the attitudes of the participants towards natural disasters. According to the reliability analysis

results of this scale, “reliability score is 0,87”. The scales in the second and third parts of the questionnaire are in the form of five-point Likert (1: completely agree, 2: agree, 3: undecided, 4: disagree, 5: strongly disagree). In the last part of the questionnaire, there is ‘Natural disaster literacy achievement test’ consisting of 24 questions. In the achievement test, empty and wrong questions were scored as ‘0’ points and correct answers were scored as ‘1’ point. The minimum score that can be obtained from the test is ‘0’ and the maximum score is ‘24’. The interpretation of the test is ‘Low Score’ between 0-6 points, ‘Medium Score’ between 7-18 points, and ‘High Score’ between 19-24 points. According to the reliability analysis results of this achievement test, ‘Cronbach Alpha’ value is 0,81. The ‘Cronbach Alpha’ value of the measurement tool used was calculated as 0,89. In scale reliability, Cronbach Alpha value of 700 and above is accepted as a sufficient value (Seçer, 2015, p. 219). This shows that the scale reliability is high.

Table 1

Scale Reliability

Cronbach’s Alfa	Number of Questions
0,89	72

Collection of Data and Analysis

Necessary permissions were obtained from Ankara Provincial Directorate of National Education for the implementation of the questionnaires. In the study, 306 questionnaires were distributed and collected by personally visiting secondary schools in the central districts of Ankara. In order to reach social studies teachers, the seminar period was preferred for the implementation of the questionnaires and the data were collected within a week.

The data obtained from the questionnaires were transferred to the computer environment and subjected to statistical analyses using SPSS 22.0 package programme. Kolmogorov-Smirnov and Shapiro-Wilk normality tests were applied to determine whether the research data were normally distributed. Independent Sample t test was performed with paired groups showing normal distribution and One-Way ANOVA analyses were performed with multiple groups, and percentage frequency, mean, standard deviation scores were calculated to find descriptive statistics. Scheffe test from Post-Hoc Analysis was applied to determine the direction of significance of the emerging significant groups. In all statistical procedures, significance was accepted as $p < 0.05$.

Table 2

Normality Test Results

	Skewness	Kurtosis
NDL Behaviour Scale	0,329	0,260
NDL Affective Tendencies Scale	0,953	1,301
NDL Achievement Test	0,804	1,291

According to the normality test results, the skewness value of NDL behaviour scale was calculated as 0.329 and kurtosis value as 0.260, the skewness value of NDL affective tendencies scale was calculated as 0.953 and kurtosis value as 1.301, and the skewness value of NDL achievement test was calculated as 0.804 and kurtosis value as 1.291. Skewness and Kurtosis values between -1.5 and +1.5 indicate that the data are normally distributed (Tabachnick & Fidell, 2013, p.68).

Ethical Committee Approval

The necessary permissions were obtained from the researcher who developed the measurement tool for the data collection tool (Survey) used in this study. It is also stated by reference in the method section of the study.

Findings

Findings Related to Demographic Characteristics of Participants

The data on the demographic characteristics of the participants obtained from the first part of the questionnaire form are presented in Table 3 as follows.

Table 3

Information on Demographic Characteristics of Social Studies Teachers

Features		f	%	Stacked %
Gender	Female	152	49,7	49,7
	Male	154	50,3	100
Marital status	Married	226	73,9	73,9
	Single	80	26,1	100
Total working years	1-5 years	49	16,0	16,0
	6-10 years	51	16,7	32,7
	11-15 years	63	20,6	53,3
	16 years and over	143	46,7	100
Have you experienced a disaster before?	Yes	204	66,7	66,7
	No	102	33,3	100

Did you take a course on natural disasters during your university education?	Yes	164	53,6	53,6
	No	142	46,4	100
Do you know the disaster plan of the school where you work?	Yes	194	63,4	63,4
	No	112	36,6	100
Have you participated in activities related to natural disasters?	Yes	216	70,6	70,6
	No	90	29,4	100
Do you know the emergency assembly area of the school where you work?	Yes	259	84,6	84,6
	No	47	15,4	100
Which activities related to natural disasters would you like to participate in?	Seminar-Conference	41	13,4	13,4
	Earthquake drill	45	14,7	28,1
	Fire drill	4	1,3	29,4
	First aid training	101	33,0	62,4
	Aid campaign	20	6,5	69,0
	Search and rescue	80	26,1	95,1
	None	15	4,9	100
	Total	306	100	

Table 3 shows that 152 female (49.7%) and 154 male (50.3%) social studies teachers participated in the study. The marital status of the participants was 226 (73,9%) married and 80 (26,1%) single. In terms of total years of experience, 49 (16%) of the participants have been working for 1-5 years, 51 (16,7%) for 6-10 years, 63 (20,6%) for 10-15 years, and 143 (46,7%) for 16 years or more. This shows that the participants are mostly experienced teachers. 204 (66.7%) of the teachers stated that they had experienced a disaster before, while 102 (33.3%) stated that they had not experienced a disaster before. To the question ‘Did you take a course on natural disasters in your university education?’ 164 (53,6%) of the teachers who participated in the research answered yes and 142 (46,4%) answered no. While 194 (63,4%) of the teachers knew the disaster plan of the school where they worked, 112 (36,6%) did not. Again, 216 (70,6%) of the teachers participated in a disaster-related activity, while 90 (29,4%) of them did not participate in a disaster-related activity. While 259 (84,6%) of the teachers were aware of the emergency assembly area of the school where they worked, only 47 (15,4%) were not aware of the emergency assembly area. When the teachers were asked which activity they would like to participate in related to natural disasters, 101 of them (33%) answered that they would like to participate in first aid training, 80 (26,1%) in search and rescue, 45 (14,7%) in earthquake drills, 41 (13,4%) in seminars-conferences, 20 (6,5%) in aid campaigns, 4 (1,3%) in fire drills and 15 (4,9%) in none of them.

Evaluation of NDL Behaviour Scale Data

The scores of the social studies teachers' NDL behaviour levels were determined and scored with a five-point Likert analysis method as “Always (5 points), Mostly (4 points), Sometimes

(3 points), Occasionally (2 points), Never (1 point)". Questions 17, 18, 19, 20, 21, 22 and 23 in the scale were reverse coded because they were negative.

Table 4

NDL Behaviour Level Score Scale

Score Value	Level
1-2.33	Low
2.34-3.67	Medium
3.68-5.00	High

In order to determine the general score of the social studies teachers, the scores of their responses to the questionnaire statements were summed and their arithmetic averages were taken. In this context, the scores obtained were interpreted as follows; the DOA behaviour levels of social studies teachers decrease as they approach 1 and increase as they approach 5. As seen in Table 4, those with a score value of 1-2.33 have 'Low', those with a score value of 2.34-3.67 have 'Medium', and those with a score value of 3.68-5.00 have 'High' literacy level.

Table 5

NDL Behaviour Level Score Scale

NDL Behaviour Level Score Averages	n	MEAN,±S.DEVIATION
	306	3.41±0.580

The overall mean of the NDL behaviour level scores of social studies teachers was calculated as 3.41 with a standard deviation of 0.58, and the mean value obtained shows that the natural disaster literacy behaviour of social studies teachers is at a moderate level.

Table 6

The t-Test of the Difference between the Marital Status of Social Studies Teachers and their

NDL Behaviour Levels

Dimension	Marital Status	n	X	SS	SD	t	P
NDL Behaviour Level	Married	226	3,440	0,587	145,183	0,241	,231*
	Single	80	3,350	0,558			

*p<0,05

When the natural disaster literacy behaviour levels of social studies teachers according to marital status are compared in Table 6, it is seen that the highest mean ($X = 3,440$) belongs to the group whose marital status is married.

In order to test whether there is a significant difference between the NDL behaviour levels of social studies teachers and their marital status, t-test, which is a parametric test among statistical tests, was applied, but no significant difference was found.

Table 7

ANOVA Test of the Difference Between Social Studies Teachers' Total Years of Working Experience and NDL Behaviour Levels

Dimension	Total Years of Working	n	X	SS	t	P
NDL Behaviour Level	1-5 years	49	3,358	0,593	2,376	,070*
	6-10 years	51	3,284	0,678		
	11-15 years	63	3,365	0,476		
	16 years and over	143	3,506	0,572		
	<i>Source of Variance</i>	<i>KT</i>	<i>SD</i>	<i>KO</i>		
	Between Groups	2,372	3	,775		
	In Group	100,506	302	,334		
	Total	102,877	305			

*p<0,05

As Table 7 shows, when the total working years of social studies teachers and their NDL behaviour levels are compared, it is seen that the highest mean ($X=3,506$) belongs to teachers with a total working year of 16 years or more. This is followed by 11-15 years ($X=3,365$), 1-5 years ($X=3,358$) and the lowest average belongs to teachers with 6-10 years ($X=3,284$) working years.

As a result of One-Way ANOVA test, which is one of the parametric tests among the statistical tests conducted to test whether there is a significant difference between social studies teachers' NDL behaviour levels and their total working years, no significant difference was found.

Table 8

The t-Test of the Difference Between Social Studies Teachers' Experiences of Natural Disasters and NDL Behaviour Levels

Dimension	Disaster Experience	n	X	SS	SD	t	P
-----------	---------------------	---	---	----	----	---	---

NDL Behaviour Level	Yes	204	3,407	0,581	201,998	0,113	,677*
	No	102	3,436	0,581			

*p<0,05

Table 8 shows that the highest mean ($X=3,436$) belongs to those who have never experienced a natural disaster, while the mean ($X=3,407$) of those who have experienced a natural disaster is low.

In order to test whether there is a significant difference between the NDL behaviour levels of social studies teachers and their disaster experience, t-test, one of the parametric tests, was applied, but no significant difference was found.

Table 9

The t-Test of the Difference Between Social Studies Teachers' Receiving Disaster Education at University and NDL Behaviour Levels

Dimension	Receiving Disaster Education at University	n	X	SS	SD	t	P
NDL Behaviour Level	Yes	164	3,450	0,583	298,611	0,413	,278*
	No	142	3,378	0,577			

*p<0,05

Table 9 shows that the highest mean ($X=3,450$) belongs to those who took a course on natural disasters at university and the lowest mean ($X=3,378$) belongs to those who did not take a course on natural disasters at university.

In order to test whether there is a significant difference between social studies teachers' NDL behaviour levels and their taking courses on natural disasters at university, t-test, one of the parametric tests, was applied, but no significant difference was found.

Table 10

The t-Test of the Difference between Social Studies Teachers' Knowledge of the Disaster Plan of the School where They Work and Their NDL Behaviour Levels

Dimension	Knowing School Disaster Plan	n	X	SS	SD	t	P
NDL Behaviour Level	Yes	194	3,467	0,563	219,393	0,054	,044*
	No	112	3,328	0,602			

*p<0,05

When the NDL behaviour levels of social studies teachers are compared according to their knowledge of the disaster plan of the school where they work, it is seen that the mean of those who know the disaster plan of the school where they work ($X=3,467$) is higher than those who do not ($X=3,328$).

The t-test was applied to test whether there was a significant difference between social studies teachers' NDL behaviour levels and their knowledge of the disaster plan of the school where they work. As a result of the t-test, it was seen that there was a significant relationship between social studies teachers' natural disaster literacy behaviour levels and their knowledge of the disaster plan of the school they work in ($p=.044$, $p<0.05$). In this case, it was determined that the NDL behaviour levels of those who knew the disaster plan of the school where they worked were higher than those who did not.

Table 11

The t-Test of the Difference Between Social Studies Teachers' Participation in Activities Related to Natural Disasters and NDL Behaviour Levels

Dimension	Participation in Natural Disaster Related Activities	n	X	SS	SD	t	P
NDL Behaviour Level	Yes	216	3,462	0,578	167,545	0,070	,035*
	No	90	3,308	0,575			

* $p<0,05$

In Table 11, when the NDL behaviour levels of social studies teachers according to their participation in activities related to natural disasters are compared, it is seen that the mean of those who participate in activities related to natural disasters ($X=3,462$) is higher than those who do not ($X=3,308$).

In order to test whether there is a significant difference between social studies teachers' NDL behaviour levels and their participation in activities related to natural disasters, t-test was applied. As a result of the t-test, it was seen that there was a significant relationship between social studies teachers' NDL behaviour levels and their participation in activities related to natural disasters ($p=.035$, $p<0,05$). Thus, it was revealed that the NDL behaviour levels of social studies teachers who participated in natural disaster activities were higher than those who did not participate.

Table 12

The t-Test of the Difference Between Social Studies Teachers' Knowledge of Emergency Assembly Area and NDL Behaviour Levels

Dimension	Knowing the Emergency Assembly Area	n	X	SS	SD	t	P
NDL Behaviour Level	Yes	259	3,431	0,558	57,349	0,847	,316*
	No	47	3,338	0,692			

*p<0,05

Table 12 shows that the highest mean (X=3,431) belongs to those who know the emergency assembly area of the school where they work, while the mean of those who do not know the emergency assembly area (X=3,338) is low when social studies teachers' knowledge of the emergency assembly area of the school where they work is compared with their NDL behaviour levels.

In order to test whether there is a significant difference between social studies teachers' NDL behaviour levels and their knowledge of the emergency assembly area of the school where they work, t-test, which is a parametric test among statistical tests, was applied, but no significant difference was found.

Table 13

ANOVA Test of the Difference Between the Activities Social Studies Teachers Wanted to Participate in Related to Disaster and their NDL Behaviour Levels

Dimension	Disaster Related Activity Wanted to Participate	n	X	SS	t	P
NDL Behaviour Level	Seminar-Conference	41	3,619	0,673	2,247	,039*
	Earthquake drill	45	3,434	0,564		
	Fire drill	4	3,978	0,739		
	First aid training	101	3,325	0,557		
	Aid campaign	20	3,350	0,476		
	Search and rescue	80	3,376	0,548		
	None	15	3,582	0,627		
	Source of Variance	KT	SD	KO		
	Between Groups	4,438	6	,740		
	In Group	98,439	299	,329		
	Total	102,877	305			

*p<0,05

When Table 13 is examined, when the activities that social studies teachers want to participate in related to natural disasters and NDL behavior levels are compared, it is seen that

the highest average ($X=3.978$) is Fire Drill. This is followed by Seminar-Conference ($X=3.619$), None ($X=3.582$), Earthquake Drill ($X=3.434$), Search-Rescue ($X=3.376$), Aid Campaign ($X=3.350$) and the lowest average belongs to teachers who want to participate in First Aid Training ($X=3.325$).

One-way ANOVA test was applied to test whether there is a significant difference between the NDL behavior levels of social studies teachers and the disaster-related activities they want to participate in. As a result of the application, it was seen that there is a significant difference between the NDL behavior levels of social studies teachers and the disaster-themed activities they want to participate in ($p=.039$, $p<0.05$). Post-Hoc analysis and Scheffe test were applied to determine the direction of the difference and the direction of the difference; Fire Drill - Seminar/Conference - None - Earthquake Drill - Search/Rescue - Aid Campaign - First Aid. The NDL behavior level of those who want to participate in the Fire Drill activity is higher than those who choose other activities.

Evaluation of NDL Affective Dispositions Scale Data

The NDL affective dispositions levels scores of the social studies teachers who participated in the study were determined and scored by five-point Likert analysis method as ‘I completely agree (5 points), I agree (4 points), I am undecided (3 points), I disagree (2 points), I strongly disagree (1 point)’. Questions 16, 17, 18, 19, 20, 21, 22, 23 and 24 in the scale were reverse coded because they were negative.

Table 14

NDL Affective Dispositions Level Score Scale

Score Value	Level
1-2.33	Low
2.34-3.67	Medium
3.68-5.00	High

In order to determine the general score of the social studies teachers, the scores of their responses to the questionnaire statements were summed and their arithmetic mean were taken. In this context, the scores obtained were interpreted as follows; social studies teachers' NDL affective dispositions levels decrease as they approach 1 and increase as they approach 5. As seen in Table 14, those with a score value of 1-2.33 have ‘Low’, those with a score value of 2.34-3.67 have ‘Medium’, and those with a score value of 3.68-5.00 have ‘High’ literacy level.

Table 15

NDL Affective Dispositions Level Score Scale

NDL Affective Dispositions	n	MEAN.±S.DEVIATION
Level Score Averages	306	3.61±0.475

The overall average of social studies teachers' NDL affective dispositions level scores was calculated as 3.61 with a standard deviation of 0.47, and this mean value indicated that social studies teachers' NDL affective dispositions level was 'Medium'.

Table 16

The t-Test of the Difference Between the Marital Status of Social Studies Teachers and the Level of NDL Affective Dispositions

Dimension	Marital Status	n	X	SS	SD	t	P
NDL Affective Dispositions Level	Married	226	3,631	0,492	159,032	0,713	,464*
	Single	80	3,586	0,425			

*p<0,05

Table 16 shows that the highest mean ($X = 3,631$) belongs to the group whose marital status is married when the NDL affective dispositions level of social studies teachers is compared according to their marital status.

In order to test whether there is a significant difference between the NDL affective dispositions level of social studies teachers and their marital status, t-test, which is a parametric test among statistical tests, was applied, but it was found that there was no significant difference.

Table 17

ANOVA Test of the Difference Between the Level of NDL Affective Dispositions According to Social Studies Teachers' Total Years of Employment

Dimension	Total Years of Working	n	X	SS	t	P
NDL Affective Dispositions Level	1-5 years	49	3,591	0,443	0,620	,603*
	6-10 years	51	3,548	0,531		
	11-15 years	63	3,641	0,494		
	16 years and over	143	3,645	0,458		
	Source of Variance	KT	SD	KO		
	Between Groups	,422	3	,141		
	In Group	68,500	302	,227		
	Total	68,922	305			

*p<0,05

Table 17 shows that the highest mean ($X=3,645$) belongs to teachers with a total working year of 16 years or more, followed by teachers with a total working year of 11-15 years ($X=3,641$), 1-5 years ($X=3,591$) and the lowest mean belongs to teachers with a total working year of 6-10 years ($X=3,548$). This is followed by 11-15 years ($X=3,641$), 1-5 years ($X=3,591$) and the lowest mean belongs to teachers with 6-10 years ($X=3,548$).

As a result of One-Way ANOVA test, which is a parametric test among the statistical tests performed to test whether there is a significant difference between social studies teachers' NDL affective dispositions level and total working years, no significant difference was found.

Table 18

The t-Test of the Difference Between the Level of NDL Affective Dispositions of Social Studies Teachers According to Their Experience of Natural Disasters

Dimension	Disaster Experience	n	X	SS	SD	t	P
NDL Affective Dispositions Level	Yes	204	3,622	0,457	183,678	0,274	,889*
	No	102	3,614	0,510			

*p<0,05

Table 18 shows that the highest mean ($X=3,622$) belongs to those who have experienced a natural disaster, while the mean ($X=3,614$) of those who have not experienced a natural disaster is low.

In order to test whether there is a significant difference between the level of NDL affective dispositions of social studies teachers and their disaster experience, t-test, which is a parametric test among statistical tests, was applied, but no significant difference was found.

Table 19

The t-test of the Difference Between the Level of NDL Affective Dispositions According to the Social Studies Teachers' Receiving Disaster Education at the University

Dimension	Receiving Disaster Education at University	n	X	SS	SD	t	P
NDL Affective Dispositions Level	Yes	164	3,611	0,477	298,430	0,054	,745*
	No	142	3,629	0,474			

*p<0,05

Table 19 shows that the highest mean ($X=3,629$) belongs to those who did not take a course on natural disasters at university, while the mean ($X=3,611$) of those who took a course on natural disasters at universities is low.

In order to test whether there is a significant difference between social studies teachers' NDL affective dispositions level and their taking courses on natural disasters at university, t-test, which is a parametric test, was applied, but no significant difference was found.

Table 20

The t-test of the Difference Between the Level of NDL Affective Dispositions of Social Studies Teachers According to Their Knowledge of the Disaster Plan of the School Where They Work

Dimension	Knowing School Disaster Plan	n	X	SS	SD	t	P
NDL Affective Dispositions Level	Yes	194	3,671	0,481	243,253	0,160	,011*
	No	112	3,529	0,453			

* $p<0,05$

In Table 20, when the NDL affective dispositions level of social studies teachers is compared according to their knowledge of the disaster plan of the school they work in, it is seen that the mean of those who know the disaster plan of the school they work in ($X=3,671$) is higher than those who do not ($X=3,529$).

A t-test was applied to test whether there was a significant difference between social studies teachers' level of NDL affective dispositions and their knowledge of the disaster plan of the school where they work. As a result of the t-test, it was seen that there was a significant relationship between social studies teachers' level of NDL affective dispositions and their knowledge of the disaster plan of the school where they work ($p=.011$, $p<0.05$). In this case, it was determined that social studies teachers who knew the disaster plan of the school where they worked had higher levels of NDL affective dispositions than those who did not.

Table 21

The t-Test of the Difference Between the Level of NDL Affective Dispositions of Social Studies Teachers According to Their Participation in Activities Related to Natural Disasters

Dimension	Participation in Natural Disaster Related Activities	n	X	SS	SD	t	P
	Yes	216	3,636	0,477	168,532	0,022	,338*

NDL Affective Dispositions Level	No	90	3,579	0,471
----------------------------------	----	----	-------	-------

*p<0,05

In Table 21, when the level of NDL affective dispositions of social studies teachers according to their participation in activities related to natural disasters is compared, it is seen that the mean of those who participate in activities related to natural disasters ($X=3,636$) is higher than those who do not ($X=3,579$).

In order to test whether there is a significant difference between social studies teachers' level of NDL affective dispositions and their participation in activities related to natural disasters, t-test was applied. As a result of the t-test, it was observed that there was no significant relationship between social studies teachers' level of NDL affective dispositions and their participation in activities related to natural disasters.

Table 22

The t-test of the Difference Between the Level of NDL Affective Dispositions of Social Studies Teachers According to Their Knowledge of the Emergency Assembly Area

Dimension	Knowing the Emergency Assembly Area	n	X	SS	SD	t	P
NDL Affective Dispositions Level	Yes	259	3,618	0,472	61,894	0,780	,946*
	No	47	3,623	0,498			

*p<0,05

Table 22 shows that the highest mean ($X=3,623$) belongs to those who do not know the emergency assembly area of the school where they work and the mean of those who know the emergency assembly area ($X=3,618$) is low. In order to test whether there is a significant difference between social studies teachers' NDL affective dispositions level and their knowledge of the emergency meeting place of the school where they work, t-test, which is a parametric test among statistical tests, was applied, but no significant relationship was found.

Table 23

ANOVA Test of the Difference Between Social Studies Teachers' NDL Affective Dispositions Level According to the Activities They Wanted to Participate in Related to Disaster

Dimension	Disaster Related Activity Wanted to Participate	n	X	SS	t	P
	Seminar-Conference	41	3,821	0,565	1,614	,143*

NDL	Earthquake drill	45	3,616	0,475
Affective	Fire drill	4	3,450	0,389
Dispositions	First aid training	101	3,577	0,461
Level	Aid campaign	20	3,530	0,405
	Search and rescue	80	3,598	0,430
	None	15	3,634	0,565
	<i>Source of Variance</i>	<i>KT</i>	<i>SD</i>	<i>KO</i>
	Between Groups	2,162	6	,360
	In Group	66,760	299	,223
	Total	68,922	305	

*p<0,05

When Table 23 is analysed, it is seen that the highest mean (X=3,821) is Seminar-Conference, followed by None (X=3,634), Earthquake Drill (X=3,634), Search and Rescue (X=3,616), Search and Rescue (X=3,598), First Aid (X=3,577). This is followed by None (X=3,634), Earthquake Drill (X=3,616), Search and Rescue (X=3,598), First Aid (X=3,577), Aid Campaign (X=3,530) and the lowest mean is Fire Drill (X=3,450).

One-Way ANOVA test was applied to test whether there was a significant difference between the level of social studies teachers' NDL affective dispositions and the activity they wanted to participate in related to disaster. As a result of the ANOVA test, it was seen that there was no significant difference between the level of social studies teachers' NDL affective dispositions and the disaster-related activities they wanted to participate in.

Evaluation of NDL Achievement Test Data

Tablo 24

NDL Achievement Test Score Range

	n	%	Stacked %
Low Score (0-6 Score)	2	0,7	0,7
Medium Score (7-18 Score)	46	15,0	15,7
High Score (19-24 Score)	258	84,3	100,0
Total	306	100,0	

According to the results of the achievement test of 306 social studies teachers who answered the questionnaire; 2 teachers were in the low score range between 0-6 points, 46 teachers were in the medium score range between 7-18 points and 258 teachers were in the high score range between 19-24 points.

A 24-question multiple-choice test was applied to measure the achievement levels of the social studies teachers participating in the study. The test was evaluated and subjected to statistical analysis.

Table 25*NDL Achievement Level Score Scale*

Score Value	Level
0-20	Very low
21-40	Low
41-60	Medium
61-80	High
81-100	Very high

The achievement level achievement scores of social studies teachers were organised into five groups. Those who scored between 0-20 are in the ‘Very Low’ group, those who scored between 21-40 are in the ‘Low’ group, those who scored between 41-60 are in the ‘Medium’ group, those who scored between 61-80 are in the ‘High’ group, and those who scored between 81-100 are in the ‘Very High’ group.

Table 26*NDL Achievement Level Score Means*

NDL Achievement Level Score Means	n	MEAN.±S.DEVIATION
	306	86.61±0.134

The overall mean of social studies teachers’ NDL achievement level scores was calculated as 86.61 with a standard deviation of 0.134, and this mean value reveals that social studies teachers’ natural disaster literacy achievement level is ‘Very High’.

Table 27

The t-Test of the Difference Between the Marital Status of Social Studies Teachers and NDL Achievement Level

Dimension	Marital Status	n	X	SS	SD	t	P
NDL Achievement Level	Married	226	86,358	14,781	174,165	0,983	,597*
	Single	80	87,325	11,663			

*p<0,05

Table 27 shows that when the marital status of social studies teachers and NDL achievement level are compared, the highest mean ($X = 87,325$) belongs to the group whose marital status is single.

In order to test whether there is a significant difference between the NST achievement level of social studies teachers and their marital status, t-test, which is a parametric test among statistical tests, was applied and no significant difference was found.

Table 28

ANOVA Test of the Difference Between Social Studies Teachers' Total Years of Employment and NDL Achievement Levels

Dimension	Total Years of Working	n	X	SS	t	P
NDL Achievement Level	1-5 years	49	86,940	9,364	0,286	,835*
	6-10 years	51	86,480	16,331		
	11-15 years	63	85,222	13,304		
	16 years and over	143	87,153	14,883		
	<i>Source of Variance</i>	<i>KT</i>	<i>SD</i>	<i>KO</i>		
	Between Groups	2,365	2	1,183		
	In Group	3424,253	303	11,301		
	Total	3426,618	305			

*p<0,05

When the total working years of social studies teachers and NDL achievement are compared in Table 28, it is seen that the highest mean (X=87,153) belongs to teachers with 16 years or more of total working years. This is followed by 1-5 years (X=86,940), 6-10 years (X=86,480) and the lowest average belongs to teachers with 11-15 years (X=85,522).

As a result of One-Way ANOVA test, which is a parametric test among the statistical tests performed to test whether there is a significant difference between the NDL achievement level of social studies teachers and their total working years, no significant difference was found.

Table 29

The t-Test of the Difference between the NDL Achievement Level of Social Studies Teachers According to Their Experience of Natural Disasters

Dimension	Disaster Experience	n	X	SS	SD	t	P
NDL Achievement Level	Yes	204	86,970	14,090	204,066	0,000	,527*
	No	102	85,892	13,923			

*p<0,05

Table 29 shows that the highest mean ($X=86,970$) belongs to those who have experienced natural disasters, while the mean ($X=85,892$) of those who have not experienced natural disasters is lower.

In order to test whether there is a significant difference between the NDL achievement levels of social studies teachers and their disaster experience, t-test, which is a parametric test among statistical tests, was applied, but no significant difference was found.

Table 30

The t-test of the Difference between the NDL Achievement Level of Social Studies Teachers According to their Disaster Education at the University

Dimension	Receiving Disaster Education at University	n	X	SS	SD	t	P
NDL Achievement Level	Yes	164	87,408	12,714	274,354	0,955	,286*
	No	142	85,690	15,388			

* $p<0,05$

Table 30 shows that the highest mean ($X=87,408$) belongs to those who took a course on natural disasters at the university and the lowest mean ($X=85,690$) belongs to those who did not take a course on natural disasters at the university.

In order to test whether there is a significant difference between the NDL achievement level of social studies teachers and their taking courses on natural disasters at university, t-test, which is a parametric test, was applied, but no significant difference was found.

Table 31

The t-Test of the Difference Between the NDL Achievement Level of Social Studies Teachers According to Their Knowledge of the Disaster Plan of the School Where They Work

Dimension	Knowing School Disaster Plan	n	X	SS	SD	t	P
NDL Achievement Level	Yes	194	86,288	14,693	257,508	0,870	,597*
	No	112	87,169	12,819			

* $p<0,05$

According to Table 31, when the NDL achievement level of social studies teachers is compared according to their knowledge of the disaster plan of the school where they work, it is

seen that the mean of those who do not know the disaster plan of the school where they work ($X=87,169$) is higher than those who do ($X=86,288$).

In order to test whether there is a significant difference between social studies teachers' level of achievement in NDL and their knowledge of the disaster plan of the school where they work, t-test was applied. As a result of the t-test, it was observed that there was no significant relationship between the NDL achievement level of social studies teachers and their knowledge of the disaster plan of the school where they work.

Table 32

The t-test of the Difference Between Social Studies Teachers' NDL Achievement Level According to Their Participation in Activities Related to Natural Disasters

Dimension	Participation in Natural Disaster Related Activities	n	X	SS	SD	t	P
NDL Achievement Level	Yes	216	86,740	14,199	172,136	0,096	,803*
	No	90	86,300	13,659			

* $p<0,05$

In Table 32, when the NDL achievement level of social studies teachers is compared according to their participation in activities related to natural disasters, it is seen that the mean of those who participate in activities related to natural disasters ($X=86,740$) is higher than those who do not ($X=86,300$).

In order to test whether there is a significant difference between the NDL achievement level of social studies teachers and their participation in activities related to natural disasters, t-test was applied. As a result of the t-test, it was observed that there was no significant relationship between social studies teachers' achievement level in NDL and their participation in activities related to natural disasters.

Table 33

The t-test of the Difference between the NDL Achievement Level of Social Studies Teachers According to Their Knowledge of Emergency Assembly Area

Dimension	Knowing the Emergency Assembly Area	n	X	SS	SD	t	P
NDL	Yes	259	86,907	14,309	70,389	0,061	,387*
	No	47	84,978	12,326			

 Achievement
 Level

*p<0,05

Table 33 shows that the highest mean (X=86,907) belongs to those who know the emergency assembly area of the school where they work, while the mean of those who know the emergency assembly area is low (X=84,978).

In order to test whether there is a significant difference between social studies teachers' level of achievement in NDL and their knowledge of the emergency assembly area of the school where they work, t-test, which is a parametric test among statistical tests, was applied, but no significant difference was found.

Table 34

ANOVA Test of the Difference Between Social Studies Teachers' NDL Achievement Level According to the Activities They Wanted to Participate in Related to Disaster

Dimension	Disaster Related Activity Wanted to Participate	n	X	SS	t	P
NDL Achievement Level	Seminar-Conference	41	83,048	16,755	2,310	,034*
	Earthquake drill	45	85,488	17,635		
	Fire drill	4	85,200	13,881		
	First aid training	101	85,990	13,813		
	Aid campaign	20	87,050	8,720		
	Search and rescue	80	90,937	9,516		
	None	15	80,666	17,178		
	<i>Source of Variance</i>	<i>KT</i>	<i>SD</i>	<i>KO</i>		
	Between Groups	139,239	3	46,413		
	In Group	3287,378	302	10,885		
	Total	3426,618	305			

*p<0,05

Table 34 shows that the highest mean (X=90,937) was Search and Rescue (X=90,937), followed by Relief Campaign (X=87,050), First Aid (X=85,990), Earthquake Drill (X=85,488), Fire Drill (X=85,488). This is followed by Aid Campaign (X=87,050), First Aid (X=85,990), Earthquake Drill (X=85,488), Fire Drill (X=85,200), Seminar-Conference (X=83,048) and the lowest average is None (X=80,666).

One-way ANOVA test was applied to test whether there is a significant difference between the level of achievement of social studies teachers in NDL and the activity they wanted to participate in related to disaster. As a result of the ANOVA test, it was seen that there was a significant difference between the NST achievement level of social studies teachers and the disaster-related activities they wanted to participate in (p=,034, p<0,05). Post-Hoc analysis,

Scheffe test was applied to determine the direction of the difference and the direction of the difference was as follows: Search and Rescue - Aid Campaign - First Aid - Earthquake Drill - Fire Drill - Seminar/Conference - None. The NDL achievement level of those who want to participate in Search and Rescue activities is higher than those who choose other activities.

Results and Discussion

In this study, the NDL levels of social studies teachers were tried to be determined in terms of various variables. According to the findings of the study, social studies teachers' natural disaster literacy achievement levels are high, while their behavioural and affective dispositions levels are close to medium low. When the related literature is analysed, it is seen that almost all of the studies have the same situation. This shows us that social studies teachers who have knowledge about natural disasters cannot transform this knowledge into behaviour. In parallel with our study, Türker and Sözcü (2021), in their study on geography teachers, found that the participants' natural disaster literacy levels were high, but the behavioural dimension of NDL was at a medium level. Torlak (2021), in his study on pre-service social studies teachers, stated that the participants' level of transforming their knowledge about disasters into behaviour was low. In addition, Ajar (2023) concluded in his study on geography teachers that the natural disaster achievement levels of the participants were good, but it was necessary to match this with the ability to cope with disaster.

According to the findings obtained as a result of statistical analysis of the data obtained from social studies teachers, there was no significant difference between the natural disaster behaviour levels of social studies teachers and marital status, total years of employment, experiencing a disaster, receiving training on disaster at university, and knowing the emergency assembly area of the school. On the other hand, the natural disaster literacy behaviour levels of those who know the disaster plan of the school where they work, those who have participated in training on natural disasters, and those who choose 'Fire Drill' among the activities they want to participate in related to natural disasters are high. Similarly, Demirdelen (2020) concluded in his study on primary/secondary school teachers that the NDL levels of teachers who wanted to participate in fire drills were high.

It was observed that there was no significant difference between the level of natural disaster affective dispositions of social studies teachers and their marital status, total working years, experiencing a disaster, receiving training on disaster at university, participating in activities related to natural disasters, knowing the emergency assembly area of the school where

they work, and the activities they wanted to participate in related to natural disasters. However, only the social studies teachers who knew the disaster plan of the school where they were working had high levels of NDL affective dispositions. In a study conducted by Genç, Yıldız, Kaya & Bilgili (2022) on participants aged 18-60, it was concluded that more than half of the participants had insufficient/medium level of disaster literacy. Similarly, Lathifa & Putra (2022), in their study on Indonesian students, stated that the disaster literacy levels of the students were at a medium level with a tendency to be low.

There is no significant difference between the natural disaster achievement levels of social studies teachers and their marital status, total working years, experiencing a disaster, receiving disaster education at university, knowing the disaster plan of the school where they work, participating in activities related to natural disasters, and knowing the emergency gathering place of the school where they work. Similarly, Vu et al. (2023), in a study conducted on high school students, stated that NDL knowledge, perception and skills are above average and the highest average belongs to knowledge. Logayah et al. (2023), in their study on secondary school students, stated that students' NDL achievement dimension was high, behaviour dimension was medium and skill dimension was low. Unlike our study, Zengin (2021), in his study on pre-service social studies teachers, stated that the participants had negative views on the education they received about natural disasters, the inclusion of the concept of disaster in the curriculum and the creation of disaster awareness in individuals. Uzunyol (2013), in his research on secondary school students, stated that students who had experienced disasters before had higher natural disaster knowledge levels than those who had not experienced disasters. Sucu (2021), in his study on 11th grade students, revealed that students do not have sufficient knowledge about the distribution of natural disasters on earth. It is seen that those who choose 'Search and Rescue' in the activities they want to participate in related to natural disasters have high natural disaster literacy achievement levels.

Recommendations

Although the achievement level of social studies teachers in NDL is "Very High", the level of NDL behavioral and affective dispositions is close to "Medium". It is essential for teachers, who will instill natural disaster awareness in students, not only to have theoretical knowledge about natural disasters, but also to transform their knowledge about the subject into behavior and to transfer knowledge to their students in this way in order to create this awareness in the society. In addition, in order to transform the level of natural disaster literacy knowledge

into behavior, applied and project-based teaching should be adopted while teaching courses on natural disasters in schools.

Social studies teachers who know the disaster plan of the school where they work have high natural disaster literacy levels. Therefore, teachers should be informed about the natural disaster plan. In addition, social studies teachers who participate in activities related to natural disasters have high natural disaster literacy levels. In this context, it is necessary to ensure that teachers participate in activities organized related to natural disasters in order to increase the level of natural disaster literacy.

The study was conducted to measure the natural disaster literacy levels of social studies teachers working in secondary schools and imam hatip secondary schools in the central districts of Ankara province. It is thought that it would be useful to conduct similar studies in other provinces. The study was applied to social studies teachers working in public schools, but it can also be conducted on social studies teachers working in private education institutions. In the study, a questionnaire was used as a data collection tool. The study can also be conducted using different techniques such as observation and interviews. It is also possible to focus on the applicability of research on NDL in educational institutions in other countries in our country.

Ethical Committee Approval

The necessary permissions were obtained from the researcher who developed the measurement tool for the data collection tool (Survey) used in this study. It is also stated by reference in the method section of the study.

In the meeting of Gazi University, Ethics Committee dated 13/02/2024 and numbered 03, it was decided that the study titled ‘Investigation of Social Studies Teachers’ Natural Disaster Literacy Levels in Terms of Various Variables (The Case of Ankara Province)’ was ethically appropriate. The ethics commission research code of the related research is 2024-259.

References

- Ajar, S.B. (2023). Identification of geography teacher competency in the disaster literacy. IOP Conf. Series: Earth and Environmental Science, Vol. 1190, 1-7. 25.07.2024 tarihinde <https://iopscience.iop.org/article/10.1088/1755-1315/1190/1/012048> sayfasından erişilmiştir.
- Demirdelen, S. (2020). *Osmaniye ili merkez ilçesinde görev yapan ilkokul/ortaokul öğretmenlerinin doğal afet okuryazarlık düzeylerinin belirlenmesi*. Yayınlanmamış Yüksek Lisans Tezi, Gümüşhane Üniversitesi Sosyal Bilimler Enstitüsü.
- Dikmenli, Y. & Gafa, İ. (2017). Farklı Eğitim Kademelerine Göre Afet Kavramı. *Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi*, 44, 21-36. 08.08.2023 tarihinde https://www.researchgate.net/publication/321976233_Farkli_Egitim_Kademelerine_Gore_Afet_Kavrami#fullTextFileContent sayfasından erişilmiştir.
- Genç, F.Z., Yıldız, S., Kaya, E. & Bilgili, N. (2022). Disaster literacy levels of individuals aged 18–60 years and factors affecting these levels: A web-based cross-sectional study. *International Journal of Disaster Risk Reduction*, 76, 1-9.
- Karaca, H. (2018). *Örgütlerde personel güçlendirme ve milli eğitim örgütünde personel güçlendirme yaklaşımının belirlenmesine yönelik bir uygulama*. Yayınlanmamış Yüksek Lisans Tezi, Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü.
- Lathifa, E. & Putra, R. D. (2022). Disaster Literacy Level of Indonesian College Students in Izmir, Türkiye. *Social Science Research Network*, 1-14. <https://ssrn.com/abstract=4211467> veya <http://dx.doi.org/10.2139/ssrn.4211467>.
- Logayah, D.S., Maryani, E., Ruhimat, M. & Wiyanarti, E. (2023). Investigating natural disaster literacy levels. *Earth And Environmental Science*, 1314, 1-10. 12.07.2024 tarihinde <https://iopscience.iop.org/article/10.1088/1755-1315/1314/1/012008> sayfasından alınmıştır.
- Seçer, İ. (2015). *SPSS ve LISREL ile pratik veri analizi*, 2. Baskı, Anı Yayıncılık, Ankara.
- Sözcü, U. (2019). *Öğretmen adaylarının doğal afet okuryazarlık düzeylerinin belirlenmesi*. Yayınlanmamış Doktora Tezi, Kastamonu Üniversitesi Sosyal Bilimler Enstitüsü.
- Sucu, H. (2021). *11. sınıf öğrencilerinin doğal afetlere yönelik bilişsel yapılarının kelime ilişkilendirme testi yoluyla incelenmesi*. Yayınlanmamış Yüksek Lisans Tezi, Necmettin Erbakan Üniversitesi, Eğitim Bilimleri Enstitüsü.
- Tabachnick B.G. & Fidell, L.S. (2013). *Using multivariate statistics*. Pearson.

- Tekindal, S. (2021). *Nicel, nitel, karma yöntem araştırma desenleri ve istatistik*. Nobel Akademik yayıncılık.
- Torlak, V. (2021). *Sosyal bilgiler öğretmen adaylarının afetlere yönelik farkındalıklarının incelenmesi*. Yayınlanmamış Yüksek Lisans Tezi, Gazi Üniversitesi Eğitim Bilimleri Enstitüsü.
- Türker, A. & Sözcü, U. (2021). Examining natural disaster literacy levels of pre-service geography teachers. *Journal of Pedagogical Research*, 5(2), 207-221.
- Uygun Seven, B. (2022). *Fen bilgisi öğretmen adaylarının doğal afet okuryazarlığı ile afet bilinci algı düzeylerinin çeşitli değişkenlere göre incelenmesi*. Yüksek Lisans Tezi, Kahramanmaraş Sütçü İmam Üniversitesi Fen Bilimleri Enstitüsü..
- Uzunyol, B. (2013). *8. sınıf öğrencilerinin doğal afetler hakkındaki bilgi düzeylerinin çeşitli değişkenlere göre incelenmesi*. Yayınlanmamış Yüksek Lisans Tezi, Niğde Üniversitesi, Eğitim Bilimleri Enstitüsü.
- Üstündağ, Y. (2022). *Bitlis ilinde görev yapan özel eğitim okul öğretmenlerinin doğal afet okuryazarlık düzeylerinin belirlenmesi*. Yüksek Lisans Tezi, Bitlis Eren Üniversitesi Lisansüstü Eğitim Enstitüsü.
- Vu, B.D., Nguyen, H.T., Dinh, H.V.T., Nguyen, Q.A.N. & Ha, X.V. (2023). Natural disaster prevention literacy education among vietnamese high school students. *Education Sciences*, 13(262), 1-17.
- Yalçın, E. (2016). *Ofis çalışanlarının işletmelerin uyguladıkları sosyal sorumluluğa ilişkin algı düzeylerinin belirlenmesi*. Yüksek Lisans Tezi, Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü.
- Zengin, S. (2021). *Sosyal bilgiler öğretmen adaylarının doğal afetlere yönelik görüşlerinin incelenmesi: Amasya Üniversitesi örneği*. Yüksek Lisans Tezi, Amasya Üniversitesi Sosyal Bilimler Enstitüsü.