



## 'Earthquake Week' Activity Application for High School Students

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### ABSTRACT

**Purpose:** Earthquakes in Turkey is one of the most natural disasters causing loss of life and property. Earthquake training is the most important way to reduce the damage caused by earthquakes that cannot be prevented from the formation. Given that the education level of the citizens of the country increases, it is possible to reduce the harmful effects of earthquakes. It would be beneficial to learn these rules for students and parents in formal education. In this context, in our study, some activities were designed within the frame of 'earthquake week' to examine the contribution of these activities to students' earthquake education.

**Method:** In this study, a mixed method was used using a combination of qualitative and quantitative data collection tools. In a high school located in Kastamonu province, a hazard hunt questionnaire, an earthquake drill, an earthquake information seminar and an interview form in which activities were evaluated were applied. These activities were applied to 250 high school students during the earthquake week. The data obtained were analyzed by SPSS 20 and content analysis. **Findings:** It was observed that the students realized that the unstructured risks to earthquakes were quite high in their homes and the building they lived in, but their parents' attempts to correct them were limited. It was stated that the earthquake drill and informative seminar were very useful for the students. As a result of the training given and the questionnaires applied, it was concluded that there was a significant improvement in students' knowledge, attitude and behavior towards earthquake. **Implications for Research and Practice:** In light of the results, it has been proposed that earthquake week activities be held in all formal educational institutions within the specific plan and program.

## Introduction

The events that occur in people's living areas, resulting in loss of life and property, are called disasters. Natural disasters, which have natural, human, biological and extraterrestrial types, are the most effective ones. Natural disasters are disasters that start in completely natural ways in which there is no intervention of human beings, which can continue for decades in addition to those whose duration is only a few seconds depending on the type, which may cause considerable destruction for the living world, which disrupt normal life conditions, which may create psychological and sociological problems in social memory as well as the loss of life and property for societies (Sozcu, 2019a, p. 6).

Tectonic earthquakes are the disasters that cause the greatest loss of life and property in the natural disaster types on Earth. Earthquakes, which are phenomena unknown to humanity, may create great fear because unlike other natural disasters, including hurricanes and floods, earthquakes abruptly and without warning cut off the normal flow of human activity. The movement of tectonic plates can last only a few minutes but may cause considerable death and destruction (Penna & Rivers, 2013). It is estimated that approximately one million earthquakes occur on earth every year. Only around 5% of these earthquakes are felt, and others have quite low magnitudes (QAI, 2012). There are three major earthquake zones in the world: the Pacific Fire Circle, the Alpine-Himalayan Belt and the Atlantic Ocean Ridges. In the middle of the Old World Land (Eurasian and Arabian plates), the land of Turkey in the Mediterranean earthquake zone has been broken down by fractures in the recent geological past and is subject to earthquakes with different severity and frequency depending on the structural features of the Earth's crust (Erinc, 2000).

According to AFAD (Disaster and Emergency Management Authority) (2019) data, Turkey is among the world's riskiest countries concerning earthquakes. There were 210 earthquakes (6.0 and greater) in Turkey between 1900 and 2017. Accordingly, a large earthquake occurs in Turkey every five years on average, causing extensive loss of life and property. 86.802 people lost their lives in these earthquakes, 597.865 houses were severely damaged. Erdik (2013) stated that there was a material loss of \$ 25 billion in these earthquakes. As a result of the geological age and formation of Turkey, there is the possibility of earthquakes in almost every region. When considering the loss of life and property caused by the earthquakes experienced, the most losses were experienced in the earthquakes that occurred on the North Anatolian Fault (NAF) line. The 1939 and 1992 Erzincan and 1999 Izmit and Düzce earthquakes caused the most casualties in the history of the Republic of Turkey.

The damage that arises from earthquakes as a natural event is closely related to the level of development of countries. According to CRED (2018) data, the number of deaths caused by earthquakes and other natural disasters is increasing as the income level of countries falls. The level of development of countries may affect many factors, from the construction of earthquake-resistant buildings, to the level of public awareness about earthquakes and disaster management practices of countries. After

the 1999 Izmit and Düzce earthquakes in Turkey, significant developments in disaster management began to take place.

There are major stages of modern disaster management that are accepted worldwide. Disaster Emergency Management is a modern discipline for dealing with and avoiding risks from natural disasters, such as fire, flood or earthquake (Saban, 2014). Disaster Management consists of four main phases: harm reduction, preparedness, response, and remediation. However, these phases can be detailed up to eight phases, such as harm reduction, preparedness, prediction and early warning, disasters, impact analysis, intervention, remediation and reconstruction (Kadioglu, 2008). Modern disaster management consists of two main parts as risk and crisis management. Risk management includes what needs to be done before disaster and the main step is to identify risks. In this process, there are certain tasks that the state and individuals must do. Risk management is coordinated and organized in a healthy manner; the loss of life and property caused by earthquakes will remain at a minimum level. Thus, earthquake education is vital in countries with high earthquake risk, such as Turkey.

Earthquake training actually means that individuals know what they need to do before, during and after the earthquake and how to apply it. Earthquake training to be given to students in the formal education system will contribute to the awareness of both students and their families. Before the earthquake, students should do damage reduction work on behalf of themselves and their surroundings (e.g., danger hunting, disaster and emergency bag preparation, disaster planning) and to be prepared for what to do during an earthquake (informed, earthquake exercise) in earthquake training takes precedence concerning risk management. Especially Hazard hunting and earthquake drills are thought to be useful in converting what needs to be done before and during an earthquake into practice. Using hazard hunting, students will be able to be aware of non-structural risk situations in the environment they lived in before the earthquake. With the earthquake drill, students are expected to make a habit of how to move in the building during and after the earthquake. According to Codreanu, Celenza and Jacobs (2014; cited in Mizrak, 2018), in the research conducted to investigate how disaster education affects knowledge and skills in disaster situations and how it affects behavior change for survival after the disaster, it was concluded that the training individuals received was effective both theoretically and practically. Smawfield (2012) stated that one of the most underrepresented areas in the literature about education and natural disasters is the study of learning about how schools can respond to real-life disasters, the challenges they face, the roles they need, and the lessons that can be drawn from all of this. Smawfield (2012) stated that the situation also appears valid for earthquake research training in Turkey. Değirmençay and Cin (2016) concluded that earthquake education research in Turkey is aimed to measure students' knowledge level and perceptions and that individuals were not adequately involved in earthquake preparation studies. Recent studies on earthquake education in Turkey and around the world have been examined. Accordingly, Dikmenli et al. (2018) elucidated animation, Coban (2017) explained three-dimensional game, Dogan and

Koc (2017) reported on digital game, Henson (2015) noted simulation and video earthquake training studies have been performed. Also, Johnston et al. (2011) focused on earthquake drill, Mermer, Donmez and Daghan (2018) reported on earthquake preparedness training, Kivrak (2019) addressed middle school and high school students to earthquake education and practice, Erkin (2019) reported on the impacts of educational games on academic achievement and attitudes of middle school students against earthquakes, Acikgoz (2019) made a comparison of different training formats for middle school students with mental disabilities mild earthquake, Sahan (2019) reported on middle school students at the center using the method of simulation disaster training earthquake, Karagoz (2019) conducted a study that determined the effects of the inverted class model on high school students 'learning about earthquake disasters, Aksoy and Sozen (2014) focused on high school students' views on earthquake education in geography class and Demiroz (2019) reported the middle school students ' knowledge about earthquake and evacuation.

#### *Research Question*

It is observed that the effects of depreciation education studies on academic success, in general, have been investigated in Turkey. Therefore, the present study aims to make activities that will increase the awareness of high school students in depreciation within the framework of the first week of March and express the situations in which these activities increase the awareness of their students. This research is significant because it will help students gain awareness by doing pre-earthquake preparedness and harm reduction studies firsthand and understand how they should behave during and after the earthquake with training and exercise. Accordingly, the answers to the following questions were sought.

1. What are the general knowledge and preparations of high school students for earthquakes?
2. How is the situation of the buildings and houses of high school students in which they live in terms of earthquake hazard?
3. Does the information of high school students for earthquake (e.g., earthquake experience, family earthquake experience and earthquake-related activity) create a significant difference in the hazard hunt activity scores?
4. Does the personal information of high school students (gender, mother and father education) create a significant difference in the hazard hunt activity scores?
5. What are the opinions of high school students about the training and the drill?

### **Method**

#### *Research Design*

In a mixed method in which qualitative and quantitative methods are used together. Since all data collection methods have their limitations, mixed methods

neutralize or eliminate these disadvantages. Because of the complex structure of social science studies in particular, different types of methods should be used to understand these complex structures in the best way. The quantitative study in this patterning is supported by qualitative data (Creswell, Clark, Gutman, Hanson, 2003).

### *The Study Group*

The study group consisted of students studying at a secondary school in Kastamonu province Center. The information for the workgroup is shown in Table 1.

**Table 1**

#### *Participants' Information*

		Frequency	%
<b>Gender</b>	Female	146	57,9
	Male	106	42,1
<b>Mother-Education</b>	Illiterate	1	0,4
	Primary School	67	26,6
	High School	58	23
	University	109	43,3
	Post Graduate	17	6,7
<b>Father Education</b>	Illiterate	0	0
	Primary School	25	9,9
	High School	65	25,8
	University	135	53,6
	Post Graduate	27	10,7
<b>Total</b>		252	100

When Table 1 was examined, 252 high school students, including 146 girls and 106 boys, participated in this study voluntarily. When the parents' education status of the students was examined, it was seen that the university graduates had the highest proportion. The easily accessible sampling method was preferred when creating the working group. This method gives speed and practicality to research by preferring a situation that is close and easy to reach (Yildirim & Simsek, 2013).

### *Data Collection Tools*

Quantitative and qualitative data collection tools were used in this study to triangulate findings. A 'hazard hunting survey' was administered on the first day of earthquake week as a quantitative data collection tool. In the first part of the two-part survey, students were asked about their personal ideas on earthquakes. The second section consisted of a 'Hazard Hunting' form which would allow students to examine the buildings and houses they lived in and which consisted of questions they must answer in the form of yes-no. The questions in the form were prepared as a result of the literature review and using AFAD sources. First, the draft questions were examined in accordance with expert opinions and then applied to a group of 30 students who did not participate in the survey. Six in the survey form out of 20

questions consisted of questions about the building and 14 questions about the flat they lived in. In the questions about the building, the measures taken against the earthquake in the building were examined. In the questions about the house, it was asked whether the furniture in the house was arranged in accordance with earthquake preparedness. In general, the Cronbach Alpha reliability coefficient (.80) of the items composing the questionnaire was high. 0 'point was given to the items given the answer 'No' and 1 'point was given to the items given the answer 'Yes'. Three negative items were reverse coded while the data was processed. High score referred to high-level measure against earthquake risk, low score referred to low-level measure.

After the 'hazard hunting' was implemented, an 'Earthquake Information Seminar' was conducted by an expert to the students who carried out the survey. The scientist, who completed his doctorate in disaster education, was also a researcher who continued his scientific studies on this subject. Besides, what needs to be done before, during and after the earthquake is described by supporting or applying visuals. On the day after the seminar, the students were given an earthquake drill during the course hours without being informed about the time. As a qualitative data collection tool, during the earthquake drill, data were collected through unstructured observation by teachers and researchers who participated in the drill. In addition, semi-structured questionnaire forms were distributed to students. In this form, which was applied after Hazard hunting, Earthquake Information Seminar and earthquake drill, students were asked three open-ended questions to evaluate earthquake week activities. This form was applied to 40 students, including gender equality among students who were applied a quantitative data collection tool. Responses from four students were not appropriate, so they were removed and data from 36 were evaluated.

### *Data Analyses*

Data collected through the 'Hazard Hunting' survey, which is used as a quantitative data collection tool, was analysed with SPSS 20. Normality was tested separately for all scales and individual variables. The Kolmogorov-Smirnov test was run, and the skewness and kurtosis coefficients were checked to test normality. For normality, Morgan, Leech, Gloeckner and Barrett (2004) refer to the range (-1, +1), while Field (2009) suggests that the upper limit should be kept high for the values of flatness and skew in samples greater than 200, and that small deviations from normality hardly affect the results in large samples (cited by Kavgaci, 2014). In this context, it was determined that the value of the scales is in the reference range of the flatness and skewness. During the analysis phase, parametric tests (independent sample t-test, ANOVA) were applied after the frequency, percentage and averages of the substances were used as well as normality distribution. The qualitative data obtained by the semi-structured questionnaire were analyzed by the content analysis method. The main goal in content analysis is to reach concepts and relationships that can explain the collected data (Yildirim & Simsek, 2013, p. 259). In this study, tables were used to provide an overview as well as sample statements of the analyzed data.

## Results

The findings from this part of this study were presented respectively. Table 2 shows students' answers to questions containing personal ideas about earthquakes.

**Table 2**

*General Information about Earthquakes*

Questions	Yes		No	
	f	%	f	%
Have you experienced an earthquake before?	93	36,9	159	63,1
Have your immediate family experienced an earthquake?	170	67,5	82	32,5
Do you have an earthquake (emergency and disaster) kit?	17	6,7	235	93,3
Have you ever participated in an earthquake-related activity?	182	72,2	70	27,8
Do you know the emergency assembly point at your school?	236	93,7	16	6,3
Do you know the emergency assembly point in your neighborhood?	117	46,4	135	53,6
Do you know the name of an agency about the earthquake?	217	86,1	35	13,9
Do you have a family earthquake plan?	38	15,1	214	84,9

As shown Table 2, most of the students (63.1%) had never experienced an earthquake before, but the earthquake rates of the immediate family (67.5%) were high. Only 17 people (6.7%) had an earthquake kit and 38 people (15.1%) had a family earthquake plan. 93.7% of the students knew the school emergency assembly point, while 46.4% knew the emergency assembly point in their neighborhood. The number of students who did not participate in an earthquake-related activity was 70 (27.8%). The responses to the survey items for the building in the hazard hunt survey are presented in Table 3.

**Table 3**

*Findings of the Hazard Hunt for the Building Where the Students Live*

Questions	Yes		No	
	f	%	f	%
Does your building have an emergency exit door?	124	49,2	128	50,8
Is the building's emergency exit always open?	75	29,8	177	70,2
Does the building's emergency exit lead directly to the outside or a safe area?	91	36,1	161	63,9
Are there any goods to block the exit in front of the emergency exit doors of the building?	211	83,7	41	16,3
Is there a charged lighting device between the hallway and the stairs of the building?	113	44,8	139	55,2
Are the stairs and floor made of non-slippery material?	151	59,9	101	40,1

As shown in Table 3, 49.2% of the buildings where students lived do not have an emergency exit door, while 29.8% of these doors are left open continuously. Ninety-one of the buildings (36.1%) have emergency exit doors opening to the outside and to a safe place, while 211 buildings (83.7%) have objects to prevent emergency exit doors from opening. In addition, 44.8% of the buildings have charged lighting devices, while the number of buildings with floor Scrolls is 151.

Table 4 shows the results of the t-test to investigate whether there is a significant differentiation between the points gained after the hazard hunt applied in the students' houses and the points about experiencing an earthquake, immediate family's experiencing earthquake, knowing the place of emergency assembly point in the school and neighborhood, attending to an earthquake activity, knowing the name of the institution related to the earthquake and having family earthquake plans.

**Table 4**

*t-test Results of High School Students' Home Hazard Hunting Scores based on Various Variables*

Variables	Answers	n	$\bar{X}$	S	sd	t	p																																																																																
Experiencing earthquake	Yes	93	6,04	2,76	252	0,64	.517																																																																																
	No	159	6,27	2,75				Immediate family's experiencing earthquake	Yes	170	6,14	2,60	252	0,40	.684	No	82	6,29	3,05	Earthquake kit	Yes	17	7,17	2,81	252	1,53	.127	No	235	7,01	21,12	Attending earthquake activity	Yes	182	6,41	2,79	252	2,12	.035*	No	70	5,60	2,58	The place of emergency assembly point in the school	Yes	236	2,75	0,17	252	1,02	.306	No	16	6,87	2,72	The place of emergency assembly point in the neighbourhood	Yes	117	6,60	2,71	252	2,24	.025*	No	135	5,82	2,75	Knowing the name of the institution related to the earthquake	Yes	217	6,21	2,76	252	0,30	.759	No	35	6,05	2,75	Family earthquake plans	Yes	38	7,21	2,78	252	2,50	.013*
Immediate family's experiencing earthquake	Yes	170	6,14	2,60	252	0,40	.684																																																																																
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\* $p < 0.05$

As shown in Table 4, there was a significant differentiation concerning the general points of hazard hunting of high school students to experience earthquakes



( $t_{(252)}=0.64$ ;  $p>0.05$ ), immediate family to experience earthquakes ( $t_{(252)}=0.40$ ;  $p>0.05$ ), to have an earthquake kit ( $t_{(252)}=1.53$ ;  $p>0.05$ ), to know the location of the school emergency assembly point ( $t_{(252)}=1.02$ ;  $p>0.05$ ) and to know the name of the institution related to earthquake ( $t_{(252)}=0.30$ ;  $p>0.05$ ). In other words, high school students' participation in earthquake-related activities, their knowledge of neighborhood emergency assembly point and the availability of family earthquake plans constituted a significant differentiation in hazard hunting overall scores.

ANOVA results to investigate whether the overall hazard hunting scores of high school students caused a significant differentiation according to their mother and father educational status are given in Table 5.

**Table 5**

*One-Way Variance Analysis (ANOVA) Results of High School Students' Critical Hunting Overall Scores according to Various Variables*

Variables	Answers	n	$\bar{X}$	S	F	p
Mother Education	1. Primary School	68	6,45	3,02	1,18	.316
	2. High School	58	5,89	2,62		
	3. University	109	6,03	2,64		
	4. Post Graduate	17	7,11	2,68		
Father Education	1. Primary School	25	6,36	2,11	0,88	.449
	2. High School	65	6,21	2,97		
	3. University	135	6,00	3,09		
	4. Post Graduate	27	6,19	2,75		

As shown in Table 5, the general scores of high school students in natural disaster hazard hunting did not differ significantly according to mother education status ( $F_{(3,248)}=1.18$ ;  $p<0.05$ ) and father education status ( $F_{(3,248)}=0.88$ ;  $p<0.05$ ). In other words, the mother and father education situations of high school students did not constitute a significant differentiation over the overall scores of Hazard hunting.

After the hazard hunting survey, the students were given an Earthquake Information Seminar and an earthquake drill. During the earthquake drill, unstructured observations were made by researchers and teachers in the course. As a result of these observations, it was determined that the majority of students did the collapse-trap-hold movement during the earthquake, and when the earthquake ended they evacuated the building quickly but without haste in accordance with the evacuation plan. After the Earthquake Information Seminar and earthquake exercise, a semi-structured question form was applied to evaluate earthquake week activities. The quantitative data for the answers to the question form are shown in Table 6.

**Table 6***Evaluation of High School Students for 'Earthquake Week' Activities*

Questions	Yes		No	
	f	%	f	%
Do you think the hazard hunting you have done in your home has created an awareness of earthquake on you? Please explain.	34	94,4	2	5,6
Has there been any (talk or behaviour) improvement in your home to address any deficiencies identified in the hazard hunting as a result of this activity? Please explain.	20	55,5	16	44,5
Do you think the earthquake drill and Earthquake Information Conference which have been practised at school are useful? Please explain.	36	100	0	0

In this study, findings showed that 94.4% of the students pose awareness in their own hazard hunting in their homes (see Table 6). Some of the explanations made by students for this question are as follows:

Yes, I think it creates awareness. I noticed the missing materials and misplaced items in our house.

Yes, thanks to the hazard hunting survey, I've come to understand that things in our homes need to be fixed so we'll be less affected by the earthquake.

I think yes. After the hazard hunting I made in my house, it created a great awareness that some items could pose a danger in an earthquake and that we should take more careful measures.

Yeah, I realised how much I didn't care.

I think, I'm more conscious now. Now, I know what I have to do.

Yes, I've grasped that closets and heavy items need to be secured and that in the event of an earthquake, if possible, I should stay away from them.

Yes, because I realised that if there really was an earthquake we would be taken by surprise. I had no idea of a plan for my family, an earthquake kit, or where it was safe. I thought it wouldn't happen to me. I get the seriousness of it.

Yes, I've learned about the dangers that the environment that I spend time in my home and in my life can pose during an earthquake.

Yeah. We understood where we needed to be and what we were missing.

When the data were analyzed, it was seen that students and their families had a low-level of overall awareness of the non-structural risk of earthquakes in the home.

They were found to recognise risks with danger hunting and their sensitivity increased.

As shown in Table 6, 55.5% of the students stated that they had made an attempt to address deficiencies in the home after the hazard hunting, while 44.5% stated that they had not. Some of the explanations made by the students for this question are as follows:

Yes, it happened. I fixed my bookshelf.

There was a conversation but it didn't turn into a behaviour.

Yeah. We decided to plan a family earthquake. We moved the items that were in risky places in the house.

We're thinking of preparing an earthquake kit.

No, it hasn't happened yet but we're planning to talk to the family about it as soon as possible.

Yes, it was said that we should not approach dangerous places during the earthquake and also that we should take precautions for these places.

It is important that it does not remain in thought, but there was no action other than talking.

The conversation took place but deficiencies, such as fixing items or preparing an earthquake kit were not made.

Yeah. We have prepared an earthquake kit and created the family earthquake plan.

When these answers were analyzed, the statements of those who say yes suggested that the developments were generally superficial. It was seen that there were problems in the application dimension where developments remained only in the speaking dimension.

In the third question shown in Table 6, all of the students stated that earthquake exercise and Earthquake Information Conference were useful. Some of the explanations made by the students for this question are as follows:

Yeah. Because in a period of many earthquakes, we had to learn what to do at the time, before and after the earthquake.

Yes, it did. During the exercise I learned things like how to create a triangle of life to survive, when the building was abandoned. The conference was very informative for the students. I learned that the province I live in is a fault line zone and where I should take refuge during the earthquake in different places.

Yeah. I think it raises awareness about earthquakes and gives us a better understanding of what we need to do in the face of an earthquake.

Yep. It has created an awareness of the earthquake, and I think that through this conference, many people have realized that they have incorrect or incomplete information about the earthquake and gained an awareness of the earthquake.

Yeah. I realised I wasn't holding on in a down-close-hold position.

Yeah. I learned exactly what to do when the earthquake happened. I've learned the gathering places, the main beams. So I became more conscious.

I think yes. I was informed that the earthquake was a natural disaster that could happen to anyone and could not be prevented, but that the damage could be minimized by taking the necessary precautions.

Yeah. If I buy a house when I grow up, I'll check the facade to see if it's earthquake-resistant.

I think the videos shown at the Earthquake Information Conference are useful. I might be more cautious about the possibility of things tipping over in a possible earthquake.

Yeah. If the earthquake drill had not been done, everyone could have rushed out when the earthquake happened.

Yeah. Thanks to the drill, I've learned how to act in the event of an earthquake. At the conference, I learned what I had to do before, during and after the earthquake. I also learned about earthquakes and fault lines in the area where I live.

The findings showed that the students recognized the lack of knowledge they saw in themselves and learnt new information on earthquake.

### **Discussion, Conclusion and Recommendations**

In this study, the effectiveness of earthquake education activities conducted for students in a secondary education institution during earthquake week in Turkey was tested. For this purpose, first of all, a hazard hunting survey was applied to the students, which included the precautions to be taken before the earthquake. The results revealed by the survey have been summarized below.

In the first part of the hazard hunting activity, the pre-earthquake preparedness conditions of the students and their families were determined. The results showed that a large proportion of the students did not have emergency and disaster kits. The phrase 'earthquake kit preparation,' which is among the social studies lesson gains in primary school, suggests that students have learned what is in the kit. Demirci and Yildirim (2015) showed in their study that high school students have sufficient knowledge of earthquake kits. However, as can be seen in our study, it was concluded that the students who had knowledge about the earthquake kit did not

convert this information into behavior or did not feel the need. It was found that 27.8% of the students did not participate in an earthquake-related activity. The group of students who did not participate in the activity was included in the activity through the Earthquake Information conference within the scope of earthquake week activities. It is a positive result for students to know the emergency assembly points in their schools to a large extent. In contrast, half of the students do not have knowledge of the neighborhood gathering places. It is important for individuals to know their emergency assembly points because they are meeting points with their relatives with whom they cannot communicate after the earthquake. This conclusion led to the conclusion that the students' families had no plans for an earthquake because in the family earthquake plan, the gathering places should also be determined. 84.9% of the students lack a family earthquake plan. The Santos-Reyes's (2016) study also found that students' knowledge of earthquake preparedness was inadequate. Finally, it was revealed that the students knew the names of the institutions related to the earthquake, particularly AFAD and AKUT. This rate (86.1%) was extremely high according to Sozcu's (2019b) study for university students (64.9%).

When the results of the earthquake hazard survey conducted by the students for the building they lived in were examined, it was observed that 50.8% of the buildings did not have an emergency exit door. This result did not include structural risks that students or their families might regulate. This result showed that students' families did not pay enough attention to this criterion when buying or renting a house. It has been concluded that the emergency exit doors are not always open, that there are items to block the exit, and that these doors are not opened to a safe area. In addition, the proportion of buildings with charged lighting equipment was very low. These results are the situations that can be corrected by the students and their families and which can be demanded from the building management to be corrected.

There are notable results from the hazard hunting survey conducted by students towards their homes. According to this, when the students' maximum points from the survey were considered, the hazard hunting scores in their homes were gained. This finding suggests that the average students are taking a low-level of measures to reduce the risks of homes before the earthquake. As with our earthquake kit results, these results suggest that there are difficulties in converting information into behavior. When the differentiation status of the home hazard hunting survey according to various variables was examined, the hazard hunting scores of the students who had an earthquake bag, who participated in the earthquake-related activity and had a family earthquake plan were high. This shows that students and their families who are prepared for earthquake behavior take precautions against non-structural risks in their homes. However, it was concluded that there was no effect of maternal and paternal educational conditions on the behavior of reducing non-structural risks at home against earthquakes. Aksoy and Sozen (2014) found in their study that the rate of students having meetings with their families on earthquakes was very low. This result suggests that other factors may be effective in earthquake awareness rather than the level of education.

Earthquake Information Seminar was held for the students after the hazard hunting. After the seminar, the earthquake drill was carried out without specifying the date and time. As a result of the observations by the teachers and researchers, it was observed that the students took the correct position during the earthquake and reached the emergency assembly area by evacuating the building regularly and quickly in accordance with the evacuation plan taught in the seminar. Johnston et al. (2011) concluded that earthquake drill training in schools in New Zealand was successful. Cin and Degirmençay (2018) stated that some students chose safe options during an earthquake, while others preferred options that could have negative consequences. They also found students' desire to escape their location during an earthquake to be the most common but also the most unsafe decision. In this respect, it is thought that the earthquake drill will be useful for the students to gain the habit of the actions which must be done during and after the earthquake.

The opinions of the students on the hazard hunting survey, Earthquake Information Seminar and earthquake drill were collected through the interview form. The goal here is to make students aware of their activities and find out if they make a difference in their lives. It is a positive result for a large part of the students to express that they have created an awareness of Hazard hunting in gaining earthquake awareness. It was concluded that the videos shown in the Earthquake Information Seminar were also effective in the emergence of this result, as stated in the student statements. Because the result of non-structural risks in homes experienced earthquakes were monitored by the students. However, it was concluded that there was not a positive but sufficient development towards the implementation of the students in their homes in terms of removing risks after the hazard hunting. In the study conducted by Izadkhah (2004), it is assumed that earthquake education of children is a crucial element in public awareness programs and plays a key role in increasing public knowledge and awareness. In this study, students' inability to transfer to their parents or their parents' inability to care enough for this condition might be effective in the occurrence of this condition. It was also concluded that the earthquake drill and Earthquake Information Seminar held at the school were found very positive by the students. Consistent results have emerged in some previous studies that show similarities with this study. Mermer, Donmez and Daghan (2018) have concluded that there has been significant improvement in Earthquake Information and family earthquake plans after the training given by the students in their experimental studies. Henson (2015) concluded that earthquake simulation and video training can positively affect students' knowledge of consciousness and readiness. Coban (2017) in his study concluded that the academic knowledge of the students who participated in the earthquake exercise, which included hands-on training, was high. Dikmenli et al. (2018) reported that animated earthquake education was more successful in its work for elementary school students, while Dogan and Koc (2017) concluded that earthquake education with digital play increased students' academic achievements. In addition, Sahan (2019) used simulation method, Karagoz (2019) used inverted classroom model and Erkin's (2019) educational games were found to be effective in earthquake and disaster education. However, Değirmençay and Cin (2016) concluded that earthquake

Education Studies in Turkey consisted mostly of experimental and non-practical studies aimed to determine the existing situation. In this context, some suggestions have been put forward in the light of the results of this research.

Since more permanent learning outcomes can be achieved when a learning environment is created for students to learn by doing and living, it is recommended to conduct a hazard hunting survey for students at all levels of education, as in our study. It is also important that earthquake exercises are organized in a serious and planned manner in all schools. Because earthquake drills are necessary for increasing the number of students who understand the importance of the subject in a country with more earthquake risk like Turkey, in his study, Yang Da (2011) proposes increasing earthquake drills and organizing activities. The periodic exercise of these exercises will help students remember the truth of the earthquake continuously and will create a habit for students about what to do during the earthquake.

The feedback obtained from the students in this study suggests that it is useful to conduct information seminars regularly during earthquake week to increase the awareness of the earthquake. Depending on the professional experience of the researcher, to create earthquake awareness in students, it is recommended to involve all branch teachers in the process.

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## Lise Öğrencileri İçin 'Deprem Haftası' Etkinlik Uygulaması

### Atıf:

Sözcü, U. (2021). 'Earthquake Week' activity application for high school students. *Eurasian Journal of Educational Research*, 92, 275-296, DOI: 10.14689/ejer.2021.92.14

### Özet

*Problem Durumu:* Codreanu, Celenza ve Jacobs'a (2014; Akt. Mızrak, 2018) göre afet eğitimlerinin afet durumlarında bilgi ve becerileri ne kadar etkilediği ve afetten sonra hayatta kalmak için davranış değişikliğini nasıl etkilediğini tespit etmek için yapılan araştırmada bireylerin okulda, ailede, toplumda ve kendi imkânlarıyla aldığı eğitimleri hem teorik hem de pratik olarak uygulamanın etkili olduğu sonucuna ulaşılmıştır. Smawfield (2012) literatürde eğitim ve doğal afetler hakkında en az temsil edilen alanlardan birinin okulların gerçek hayat afetlerine nasıl tepki verebileceği hakkında bilgi edinmek, karşı karşıya kaldıkları zorluklar, ihtiyaç duydukları roller ve tüm bunlardan çıkarılabilecek dersler konusundaki çalışmalar olduğunu ifade etmiştir. Smawfield'in (2012) belirttiği durum Türkiye'deki deprem eğitimi araştırmaları için de geçerli görünmektedir. Değirmençay ve Cin (2016) Türkiye'deki deprem eğitimi araştırmalarının öğrencilerin bilgi düzeyi ve algılarını ölçmeye yönelik olduğu, bireylerin deprem hazırlıklarını konu alan çalışmalara yeterince yer verilmediği sonucuna ulaşmışlardır. Dikmenli vd. (2018) animasyonla, Çoban (2017) üç boyutlu oyunla, Doğan ve Koç (2017) dijital oyunla, Henson (2015) simülasyon ve video ile deprem eğitimi, Johnston vd. (2011) deprem tatbikatı, Mermer, Dönmez ve Dağhan (2018) deprem hazırlık eğitimi çalışmaları yapmışlardır. Ortaya çıkan bu durum üzerine Türkiye'deki deprem eğitimi çalışmalarının genel olarak akademik başarıya etkisinin araştırıldığı görülmektedir.

*Araştırmanın Amacı:* Araştırmada lise öğrencilerinin deprem haftası (Mart ayının ilk haftası) çerçevesinde deprem farkındalıklarını artıracak etkinlikler yapmak ve bu etkinliklerin öğrencilerin farkındalıklarını artırma durumlarını tespit etmek amaçlanmıştır. Bu araştırma ile öğrencilerin deprem öncesi hazırlık ve zarar azaltma çalışmalarını ilk elden yaparak bilinç kazanmalarına, deprem sırası ve sonrasında eğitim ve tatbikatla nasıl davranması gerektiğini kavramlarına yardımcı olacağı düşüncesiyle önem arz etmektedir.

*Araştırmanın Yöntemi:* Araştırmada nitel ve nicel yöntemlerin birlikte kullanıldığı karma yöntem türündedir. Bu desenlemede nicel ağırlıklı yapılan çalışma nitel verilerle desteklenmektedir (Creswell, Clark, Gutman, Hanson, 2003). Çalışmada nicel ve nitel veri toplama araçları kullanılmıştır. Nicel veri toplama aracı olarak deprem haftasının ilk gününde 'Tehlike avı anketi' uygulanmıştır.

Nitel veri toplama aracı olarak deprem tatbikatı sırasında tatbikata katılan öğretmenler ve araştırmacı tarafından yapılandırılmamış gözlem yoluyla veriler toplanmıştır. Ayrıca öğrencilere yarı yapılandırılmış anket formu dağıtılmıştır. Nicel

veri toplama aracı olarak kullanılan ' Tehlike Avı' anketi ile toplanan veriler SPSS 20 ile analiz edilmiştir. Yarı yapılandırılmış anket formu ile elde edilen nitel veriler ise içerik analizi yöntemi ile çözümlenmiştir.

*Araştırmanın Bulguları:* Araştırmanın ilk iki problemine yönelik olarak öğrencilerin büyük bir bölümünün (% 63,1) daha önce deprem yaşamadıkları ancak birinci derece yakınlarının deprem yaşama oranlarının (% 67,5) yüksek olduğu görülmektedir. Yalnızca 17 kişinin (% 6,7) deprem çantasının ve 38 kişinin (% 5,1) aile deprem planı olduğu tespit edilmiştir. Öğrencilerin % 93,7'si okul acil toplanma yerini bilirken, %46,4'ü de mahalle acil toplanma yerini bilmektedir. Depremle ilgili bir faaliyete katılmayan öğrenci sayısı 70 (% 27,8) olmuştur.

Üçüncü probleme ait bulgular öğrencilerin oturdukları binaların % 49,2'sinde acil çıkış kapısı bulunmadığını bu kapıların % 29,8'inin sürekli açık bırakıldığı tespit edilmiştir. Binaların 91 tanesinin (% 36,1) acil çıkış kapıları dışarıya ve güvenli bir yere açılırken, 211 binanın (%83,7) acil çıkış kapısının açılmasını engelleyecek nesnelere bulunmaktadır. Ayrıca binaların % 44,8'inde şarjlı aydınlatma cihazı bulunurken, zemin kaydırmazları bulunan bina sayısı 151 olarak tespit edilmiştir.

Lise öğrencilerinin tehlike avı genel puanları deprem yaşama, yakını deprem yaşama, deprem çantasına sahip olma, okul acil toplanma yerini bilme ve depremle ilgili kurum ismi bilme durumuna göre anlamlı bir farklılık göstermemektedir. Lise öğrencilerinin tehlike avı genel puanları depremle ilgili faaliyetlere katılma, mahalle acil toplanma yerini bilme ve aile deprem planlarının olma durumlarına göre anlamlı bir farklılık göstermektedir. Son olarak lise öğrencilerinin doğal afet tehlike avı genel puanları anne eğitim durumuna ve baba eğitim durumuna göre anlamlı düzeyde farklılık göstermemektedir. Araştırmanın son problemine ait bulgular incelendiğinde öğrencilerin % 94,4'ünde evlerinde yaptıkları tehlike avının kendilerinde bir farkındalık oluşturduğu; öğrencilerin %55,5'inin tehlike avı sonrasında evdeki eksiklikleri giderme konusunda bir girişimde buldukları %44,5'inin ise bulunmadıkları ve son olarak öğrencilerin tamamı deprem tatbikatı ve deprem bilgilendirme konferansının yararlı olduğunu ifade etmişlerdir.

*Araştırmanın Sonuçları ve Öneriler:* Araştırma sonuçları öğrencilerin deprem yaşama oranlarının düşük ancak ailelerinin deprem yaşama oranlarının yüksek olduğunu göstermektedir. Ayrıca öğrencilerin büyük bir kısmının acil durum ve afet çantalarının bulunmadığı buna karşılık öğrencilerin okullarındaki acil toplanma yerlerini büyük oranda bildiği ortaya çıkmaktadır. Ancak öğrencilerin yarısının mahalle toplanma yerleri konusunda bilgi sahibi olmaması dikkati çekmektedir. Bireylerin acil toplanma yerlerini deprem sonrası iletişim kuramadıkları yakınları ile buluşma noktaları olması nedeniyle bilmeleri önem arz etmektedir. Bu sonuç öğrencilerin aile deprem planlarının olmadığı sonucuna da götürmektedir. Çünkü aile deprem planında toplanma yerlerinin de belirlenmesi gerekmektedir. Öğrencilerin yaşadıkları binaların çoğunda acil çıkış kapılarının açılmasını engelleyecek nesnelere bulunduğu, bina koridor ve merdivenlerinde şarjlı aydınlatma cihazlarının olmadığı görülmüştür. Öğrencilerin tehlike avı puanları, evlerinde deprem öncesine yönelik riskleri azaltıcı önlemlerin düşük düzeyde alındığını

göstermektedir. Deprem çantası sonuçlarımızda olduğu gibi bu sonuçlar da bilginin davranışa dönüştürülmesinde sıkıntılar olduğunu göstermektedir. Ev tehlike avı anketinin çeşitli değişkenlere göre farklılaşma durumu incelendiğinde, deprem çantası olan, depremle ilgili faaliyete katılan ve aile deprem planı olan öğrencilerin tehlike avı puanları yüksek çıkmıştır. Bu durum depreme karşı davranış olarak hazırlıklı olan öğrenci ve ailelerinin evlerindeki yapısal olmayan risklere karşı tedbir aldıklarını göstermektedir. Ancak depreme karşı evde yapısal olmayan riskleri azaltma davranışında anne ve baba eğitim durumlarının etkisi olmadığı sonucuna ulaşılmıştır.

Öğrencilerin deprem tatbikatı etkinliğinde öğretmen ve araştırmacı gözlemleri sonucunda deprem sırasında doğru pozisyonu aldıkları tahliye sırasında seminerde öğretilen tahliye planına uyumlu, düzenli ve hızlı bir şekilde binayı tahliye ederek acil toplanma alanına ulaştıkları gözlemlenmiştir. Okulda yapılan deprem tatbikatı ve deprem bilgilendirme seminerinin öğrencilerce çok olumlu bulunduğu sonucuna da ulaşılmıştır.

Bu bağlamda bu araştırmada ortaya çıkan sonuçlar ışığında bazı öneriler ortaya konulmuştur.

Öğrencilere yaparak ve yaşayarak öğrenecekleri bir öğrenme ortamı oluşturulduğunda daha kalıcı öğrenme çıktıları elde edilebileceğinden yola çıkarak, çalışmamızda olduğu gibi öğrencilere tüm eğitim kademelerinde tehlike avı anketinin yapılması önerilmektedir. Deprem tatbikatlarının tüm okullarda ciddi ve planlı bir şekilde organize edilmesi de önem arz etmektedir. Çünkü deprem tatbikatları Türkiye gibi deprem riski fazla olan bir ülkede konunun önemini kavrayan öğrencilerin artması için gereklidir. Yang da (2011) çalışmasında deprem tatbikatlarının artırılması ve etkinliklerin düzenlenmesini önermektedir. Bu tatbikatların periyodik olarak yapılması hem öğrencilerin deprem gerçeğini sürekli hatırlamasını sağlayacak hem de öğrencilerde deprem sırasında yapılması gerekenler konusunda bir alışkanlık oluşturacaktır. Çalışmada öğrencilerden gelen dönütler neticesinde öğrencilerin deprem bilinci artırma adına deprem haftası içerisinde bilgilendirme seminerlerinin düzenli olarak yapılmasında yarar görülmektedir.

*Anahtar Sözcükler:* Deprem eğitimi, örgün eğitim, tehlike avı, deprem tatbikatı, deprem bilgilendirme semineri.