SCHOOL-BASED DISASTER EDUCATION THROUGH CURRICULAR AND EXTRA-CURRICULAR ACTIVITIES: A COMPARATIVE CASE STUDY

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ELANUR YILMAZ

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN THE DEPARTMENT OF CURRICULUM AND INSTRUCTION

MARCH 2014

Approval of the Graduate School of Social Sciences

_____

Prof. Dr. Meliha Altunışık
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

_____

Prof. Dr. Ayhan Demir
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

_____

Prof. Dr. Ali Yıldırım
Supervisor

Examining Committee Members

Doç. Dr. Özgür Erdur-Baker	(METU, EDS)	_____
Prof. Dr. Ali Yıldırım	(METU, EDS)	_____
Yrd. Doç. Dr. Elvan Şahin	(METU, ELE)	_____

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Name, Last name : Elanur Yılmaz

Signature :

ABSTRACT

SCHOOL-BASED DISASTER EDUCATION THROUGH CURRICULAR AND EXTRA-CURRICULAR ACTIVITIES:
A COMPARATIVE CASE STUDY

Yılmaz, Elanur
M.Sc., Department of Curriculum and Instruction
Supervisor : Prof. Dr. Ali Yıldırım

March 2014, 194 pages

The purpose of this research study is to examine formal disaster education implemented in elementary schools, and to investigate how disaster education taking place in the schools through extra-curricular activities raise awareness of and build the capacity of students; and teachers to prevent and respond appropriately to disasters. Participants of the study were 251 students at 5th grade level through 8th grade level in SchoolA implementing both curricular and extra-curricular approaches in disaster education and 95 students at 6th grade level through 8th grade level in SchoolB implementing only curricular approaches, and 6 teachers working in SchoolA in Kocaeli. An open-ended questionnaire developed by the researcher, and semi-structured interviews with three students from and six teachers in School Awere used for data collection. The qualitative data were analyzed through content analysis, and quantitative data were subjected to descriptive statistical analysis. The results revealed that students who went through both curricular and extra-curricular activities had higher awareness about disaster-related issues, vital safety-related actions were well known by those students, and major household preparedness and

mitigation measures against, particularly earthquakes, were more adopted compared to the students who participated in only curricular disaster education. The conclusionshave implications for disaster education through extra-curricular activities on immediate outcomes such as awareness, personal preparedness, home-based preparedness, and encouragement of child-parent communication.

Keywords:Disaster Education, School-Based Disaster Education, Extra-Curricular Activities, and Disaster Preparedness.

ÖZ

OKULDA ÖĞRETİM PROGRAMI VE PROGRAM DIŞI ETKİNLİKLER YOLUYLA AFET EĞİTİMİ:
KARŞILAŞTIRMALI ÖRNEK OLAY ÇALIŞMASI

Yılmaz, Elanur
Yüksek Lisans, Eğitim Programları ve Öğretim Ana Bilim Dalı
Tez Yöneticisi : Prof. Dr. Ali Yıldırım

Mart 2014, 194 sayfa

Bu çalışmanın amacı, orta okul düzeyinde öğretim programlarında yer alan afet eğitiminive program dışı etkinlikler yoluyla afet eğitimini incelemek ve bu süreçlerin konuyla ilgili farkındalıklarının ve afetlerle baş edebilme kapasitelerinin arttırılmasına, ve acil bir durum anında gerektiği gibi davranabilme bilgi ve becerilerinin geliştirilmesine, öğretmenlerin afet eğitimine karşı yaklaşımlarına etkilerini ortaya koymaktadır.Çalışmanın katılımcıları, Kocaeli ilinde bulunanOkul A'dan 251 öğrenci ve 6 öğretmen, ayrıca, Okul B'den 95 öğrencidir. Araştırma için veriler, araştırmacı tarafından geliştirilen açık uçlu sorulardan oluşan bir öğrenci anketive Okul A'da görev yapan 6 öğretmen ve 3 öğrenci ile yarı yapılandırılmış görüşme tekniği aracılığıyla toplanmıştır. Elde edilen nitel veriler, içerik analizi yöntemi kullanılarak analiz edilmiştir, nicel veriler ise betimsel analizlere tabi

tutulmuştur. Çalışmanın bulgularına göre, programda yer alan afet eğitiminin yanı sıra program dışı etkinliklerle zenginleştirilmiş afet eğitimine katılan öğrencilerde afet konularıyla ilgili farkındalıkları ve bulundukları bölge itibariyle deprem risk algıları daha yüksek çıkmıştır. Ayrıca, afet anında uygulanması gereken güvenlik davranışlarını bu öğrenciler daha iyi ve depreme karşı evde alınması gereken önlemler konusunda da daha bilinçli oldukları ortaya çıkmıştır. Bu öğrencilerin evinde depreme karşı alınması gereken pek çok temel önlem mevcuttur. Bu önlemler öğrencilerin okulda edindikleri bilgileri aileleriyle paylaştıklarına ilişkin bir gösterge olabilir. Çalışmanın sonuçları, öğrencilere daha çok katılımcı bir ortam sağlayan ve program dışı aktivitelerle zenginleştirilmiş bir afet eğitiminin konularla ilgili farkındalık, afetlere karşı kişisel hazırlık, evde alınması gereken önlemler ve konuyla ilgili öğrenci ve aile arasındaki etkileşimi üzerine etkileri konusunda önemli öneriler ortaya koymaktadır.

Anahtar Kelimeler: Afet Eğitimi, Okul Tabanlı Afet Eğitimi, Program Dışı Etkinlikler, ve Afete Hazırlık.

To My Family,

ACKNOWLEDGMENTS

In the first place, I would like to express my deepest and greatest gratitude to my mother, father, sisters, brother and my little nephew for their endless love, patience, and support to during this arduous journey.

Also, I am grateful to my advisor, Prof. Dr. Ali Yıldırım for his guidance, advice, criticism, encouragements and insight throughout the research. I would also like to give my deepest thanks to Assoc. Prof. Dr.Özgür Erdur-Baker and Assist. Prof. Dr. Elvan Şahin for their valuable feedback, contributions and guidance.

The technical assistance of Zeynep Didem İnce from Ministry of National Education, students and teachers for being the participants of this study, Ms. Midori Maruyama from Japan International Cooperation Agency and other team members are gratefully acknowledged.

I would like to thank to my dearest friends, Sevilay Bulut and Arzu Erol for their understanding and endless support. I should also thank to my friends, Neslihan Dilşad Dinç, Gülbahar Yılmaz, Burcu Çıldır, Rukiye Ayan and others for their encouragement and help.

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LIST OF ABBREVIATIONS

UN/ISDR	United Nations International Strategies for Disaster Risk Reduction
OECD	Organisation for Economic Cooperation Development
UNESCO	United Nations Education Scientific and Cultural Organization
SEEDS	Sustainable Environment and Ecological Development Society
HFA	Hyogo Framework for Action
WCDR	World Conference on Disaster Risk Reduction
UNICEF	United Nations International Children's Emergency Fund
IFRC	International Federation of Red Cross and Red Crescent Societies

CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Throughout history, disasters have become a serious concern both nationally and internationallypertaining to damages caused by them. Recently, the number of natural and human-made disasters has increased dramatically. Figure 1.1 shows the time trend of reported natural disasters between the years of 1990 and 2011.

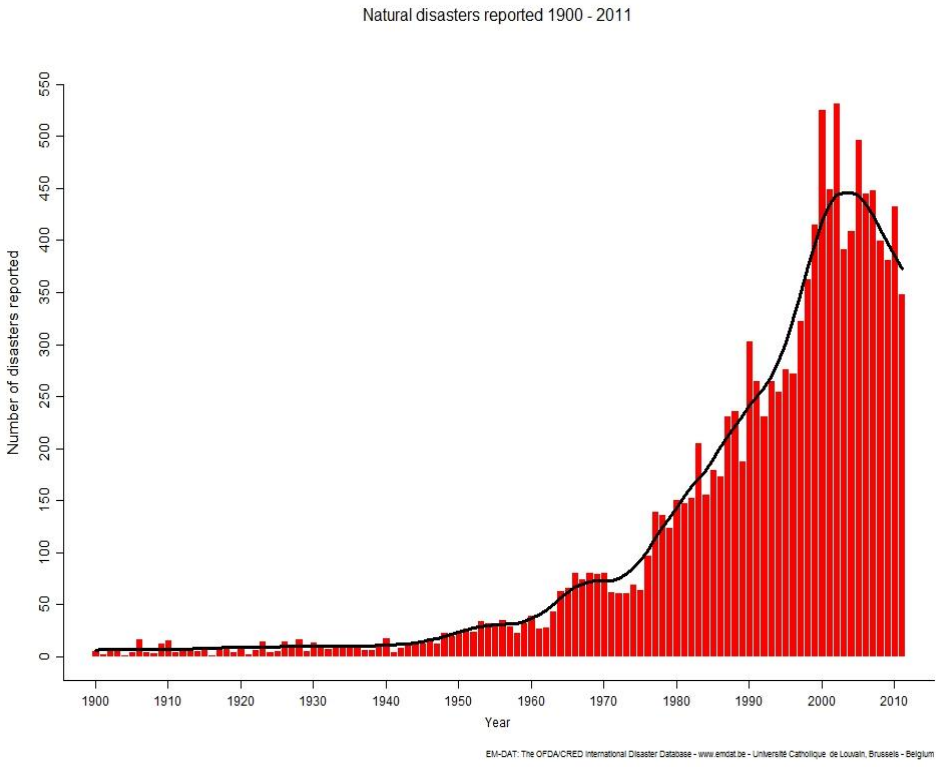

Figure 1.1. Time Trend Reported Natural Disasters, 1900-2011. Retrieved from EM-DAT: The OFDA/CRED - International Disaster Database www.emdat.be Université catholique de Louvain Brussels - Belgium

As the frequency of disasters affecting communities has risen significantly over the past century, the negative impacts of natural hazards have increased around the world. The United Nations International Strategy for Disaster Reduction [UN/ISDR] (2012) reported economic and human impacts of disasters in the last 20 years. Figure 1.2 below displays the adverse impacts of disasters reported between 1992 and 2012 years.

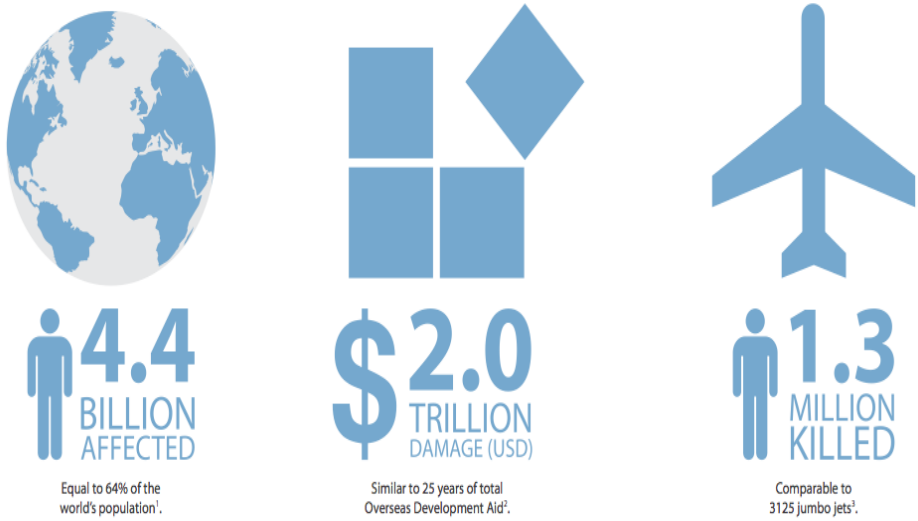

Figure 1.2. Economic and Human Impacts of Disasters in the Last 20 Years. *Affected:* The sum of injured, homeless, and people requiring immediate assistance during a period of emergency- It can also include displaced or evacuated people from disasters; *Damage:* Estimated figures; *Killed:* Persons confirmed as dead and persons missing and presumed dead. [1]UN Stats- http://unstats.un.org: Estimated mid-year world population for 2010 is 6.9 billion. [2]OECD-http://stats.oecd.org: ODA from 1986-2010 totals approximately USD 1.7 trillion. [3]Boeing 747-http://goo.gl/s5ea2: Typical 3-class passenger capacity is 416. Adapted from "Impacts of Disasters since 1992 Rio de Janeiro Earth Summit", by The United Nations Office for Disaster Risk Reduction, 14 December 2012, website: http://www.unisdr.org.

Recent disasters generated the need to develop strategies to reduce their negative impacts. Many communities around the globe have brought into focus the role ofeducation in preparing for and preventing disasters, as UN/ISDR (2007) statedthat it is crystal-clear that "knowledgeable and involved people are critical to building a safe society". The need for creating a safer society reveals the importance of imparting necessary knowledge to people in order to develop disaster management skills, and to increase awareness about disaster-related issues (Lidstone, 1995).

Previous experiences have shown the positive effects of education in disaster risk reduction. A student from Britain, Tilly Smith saved many lives by warning people on the beach against tsunami strike in 2004 in Thailand. She said that she learned the first signals of a tsunami in her geography class (UN/ISDR, 2006). With the knowledge that she gained at school, this British girl saved many lives at that time even though she did not face any tsunami in her country. This example provides strong evidence for the power of education in lessening or limiting the possible damages caused by a disaster. As another example of how education takes place in promoting disaster risk reduction and raising awareness among individuals, in the time of Indian Ocean tsunami, only seven people lost their lives. People on the Simeulue Island saved themselves and people around them by transmitting the knowledge of tsunamis from generation to generation (UN/ISDR, 2006).

In the related literature, it seems that disaster education around citizen preparedness appears in different modes. For instance, public information campaigns, family and community education, school-based initiatives, etc. can provide required knowledge and information about disaster-related issues in order to prepare for disasters (Preston, 2012). However, disaster education as a discipline surprisingly has recently been addressed in the field of education. Authorities, researchers, and educators have been still discussing what type of knowledge is needed, the appropriate levels of involvement for, and the effective ways through which such educated people may be promoted (Lidstone, 1990). Although it has not been agreed upon the ways of teaching disaster-related issues and which topics should be covered through disaster education, there is an assumption underlying all different modes of disaster education that disaster education may cause awareness

and thus awareness may cause to take proper actions to be prepared (Sims & Baumann, 1985).

Disaster education is being taught formally and informally in different countries, and its objectives, themes and instruction methods can vary greatly depending on the specific characteristics of each country and students' age group. According to the World Conference on Disaster Reduction (2005), less than half of reporting countries (N=113) teach disaster-related subjects in primary or secondary schools. While some countries, such as as Iran, Nepal, Russia, Macedonia, New Zealand, The Philippines, Turkey, USA, the Czech Republic, etc. reveal the power of formal education in disaster risk reduction through integrated into all curricula or some related curricula for all age or through extra-curricular activities, there are other countries established specialized courses at specific grade levels for the purpose of imparting necessary knowledge about disaster management and preparedness issues to students, such as India, Japan, Slovenia, and France, etc.

In the disaster education literature, the power of education on raising awareness and on being prepared for disasters has been questioned. Several researchers tried to support this argument and showed that schools have an important role in disseminating important disaster safety and preparedness information to students and parents, and maintained that education on disaster risk reduction is an essential way to ensure that learners respond appropriately to a disaster when they are faced with it (Adiyoso & Kanegae, 2012; Hosseini & Izadkhah, 2006; Johnston, et al., 2011; Ozmen, 2006; Petal & Izadkhah, 2008; Ronan & Johnston, 2005; Shaw&Kobayashi, 2001; Shaw, Shiwaku, Kobayashi, & Kobayashi, 2004; Shiwaku, Shaw, Kandel, Shrestha, & Dixit, 2007; Shiwaku & Shaw, 2008).

It is believed that children even at early ages can receive required preparedness skills through disaster education programs at schools, and they can carry them through their lives. Therefore, educators should be aware of their responsibilities to teach disaster-related topics and they also need to know how to respond to a disaster in order to be models for children.

The disaster education literature primarily has focused on three main areas: the need for creating teaching materials, reviews of disaster education content in

different learning settlements, and effective teaching methods and strategies of disaster-related issues.However, exploring the problems of teachers while teaching disaster-related issues is a much more limited area of investigation but a few researchers discussed difficulties that teachers faced pertaining to implementation of disaster education and several barriers were identified(Buluş-Kırıkkaya, Oğuz-Ünver, & Çakır, 2011; Lekalakala, 2011; Öcal, 2005).

An overview of earthquake education in the social sciences courses in elementary schools in Turkey conducted by Öcal (2005) investigated that teachers have difficulties inintegratingearthquake-related issues into their subject areas. It was revealed that teachers do not consider themselves as literate regarding to disaster education. They reported that it is necessary to improve themselves through their own preparations in order to feel more confident about teaching disaster-related issues. However, their personal preparations alone cannot ensure successful implementation of disaster education. Since teacher preparations programs, such as in-service education and pre-service education programs are intimately connected to content and pedagogical knowledge, it can be claimed that teacher preparation programs fail to provide required knowledge for pre-service teachers and in-service teachers. Furthermore, teachers mentioned that they also have difficulties in including disaster risk reduction focus into their lessons, as they are not disaster management specialists. Therefore, they thought that disaster management specialists should teach disaster-related issues in other institutions or organizations rather than schools.

Buluş-Kırıkkaya, Oğuz-Ünver, & Çakır (2011) observed similar patterns of responses; teachers have several difficulties while teaching disaster education. Teachers perceived learning objectives and activities addressing disaster-related issues as important but they claimed that they did not realize them as intended. One primary barrier identified is overloaded curriculum requirements. Teachers lack choice in the content due to the nationally mandated education system, which restricts teachers' choices in not only what they teach but also how well they teach the content. Therefore, the top-down approach in Turkish education system limits teachers' flexibility to adapt andaccommodate the integration of disaster education

into their classroom practice. Secondly, most of the teachers perceive their content and pedagogical knowledge level as inadequate for teaching disaster-related issues. Teachers are faced with uncertainties regarding decisions about what to teach for effective disaster risk reduction and how to teach it. They need a proper guidance on how they should use their curriculum to address disaster education.

Another study conducted by Lekalakala (2011) deals with perceptions of teachers on inclusion of disaster risk reduction focus into their lessons. It was revealed that teachers lack a link between physical process of disasters and socio-economic and environmental factors that affect the coping capacities of the communities. Similarly, Lindstone (1996) claimed that school textbooks that include sections on disaster-related issues have information about only physical processes and response mechanism. They cannot view the concept of disaster as a holistic and interrelated phenomenon, and so, they cannot help people to understand why some people are vulnerable to disasters and why others are not. To clarify that issue, he gave an example: only if people live in flood-prone areas, floods become a hazard for them and discussed why people are forced to live in houses built in flood-prone areas. Therefore, disaster education should be holistic and cover all its dimensions not just the occurrence of disasters or duck-cover position as a response action to an earthquake. Children should be aware of the social and economic factors behind being vulnerable to disaster events so that they can involve in a disaster context and feel powerful to change the way they live to reduce potential damages.

Overall, the findings of these studies suggest that disaster education in schools has important roles in development of coping capacities of both individuals and societiesto reduce any adverse impacts. There are successful schools implementing disaster education programs around the world. When we examined these successful programs, they have two common features. The first one is that the way that they teach disaster education fosters active participations of students. The second one is related to teacher preparations for provision of disaster education. Successful schools regarding to disaster education implementation attach a great importance to teachers, as they are perceived essential agents of the communityresilience. Therefore, they

take it serious to provide required content and pedagogical knowledge to teachers in order to increase the effectiveness of disaster education programs in schools.

On the other hand, when we look at the situation in Turkey, disaster education has been recently emphasized as a part of disaster mitigation measure.Although there are a few researchers, who tried to assess the current status of disaster education, we can say that related research studies in Turkey are scarce. Therefore, there is an urgent need to assess the current status of disaster education in Turkey.

Disaster education was integrated into the overall primary and elementary curriculum in 2003 as “cross-curriculum” subject. Although the curriculum was developed based upon constructivist teaching approach and is aimed at promoting of active participations of students, research studies showed that the situation is different in the classroom environment. Teachers more tend to use traditional teaching methods and textbooks as teaching materials for disaster education because they are more familiar with these methods and they have lack knowledge and experience about innovation teaching methods of disaster education (Öcal, 2005). Therefore, in this study, teachers were well-equipped regarding to content and pedagogical knowledge in order to achieve intended disaster education and they taught disaster-related issues through extra-curricular activities that facilitate student active involvement in the learning process. Having said that, this study gave us an opportunity to comparetwo distinctive approaches to disaster education namely, disaster education through curricular activities and disaster education through extra-curricular activities corresponding to impacts on students, teachers and household preparedness.

1.2 Purpose of the Study

The purpose of this study is to explore the current status of formal disaster education implemented in elementary schools, and to compare formal disaster education with disaster education through extra-curricular activities in order to raise awareness of and build the capacity of students, their families and teachers to prevent and respond appropriately to disasters.

The specific research questions are following:

1. What is the current status of elementary schools with respect to disaster education (e.g. the preparation of school emergency and disaster management plans, school drills for unexpected situations, physical and environmental protection, visual materials, etc.)?
2. How do teachers implement disaster education in these schools (e.g. curriculum, activities, teaching methods, materials, etc.)?
3. How do two schools using different approaches to disaster education (one using formal curriculum approach and the other using extra-curricular approach) differ with respect to disaster education process and outcomes for teachers, students and home-based preparedness?
    - **a.** What do students gain as knowledge, and skills through disaster education based upon extra-curricular activities?
    - **b.** How different do teachers approach to disaster education?
    - **c.** What types of home-based preparedness measures are for a disaster event?

1.3 Significance of the Study

There is strong evidence that education has an influence on personal preparedness to mitigate disaster risks. Muttarak and Potihisiri (2013) investigated that disaster–related education has a significant relationship with disaster preparedness for earthquake and tsunami in Thailand and disaster-related education can enhance personal preparedness, particularly, among highly educated individuals.

Moreover, numerous studies have shown that education focusing on disaster risk reduction have power to achieve two important goals: students of all ages can actively study and participate in safety measures and this lasts through their lifetime, and students pass their knowledge on their parents so that parents have required knowledge about disaster risk reduction measures and they can minimize the risks before a disaster event strikes (Finnis, Standring, Johnston, & Ronan, 2004; Johnston, et al., 2011; Ronan & Johnston, 2005; Stoltman, Lidstone, & Dechani,

2007). Similarly, Morrisey (2007) highlighted the importance of education in promoting and enabling disaster risk reduction and mentioned that if people are aware of risks, and are informed about disaster-related issues and behave properly in the times of disaster events, the number of victims and damages caused by them is far less.

It is understood from the literature, on the other hand, that disaster education in Turkey has several deficiencies. In the first place, teachers are not well qualified to implement disaster education.They have lack of knowledge and skills for using teaching materials and for developing activities related to disaster education. As a solution for this problem, Organisation for Economic Cooperation and Development [OECD] (2004) emphasized the importance of developing teacher-training, including education faculty programsfor pre-service teachers and in-service training of existing teachers for increasing the teachers' competencies about teaching disaster-related issues.Secondly, it wasrevealed that there is an urgent need to develop teacher support materials for disaster education and to formally incorporate these materials into curricula(Kırıkkaya, Ünver, & Çakır, 2011; Öcal, 2005).

In addition, there are numerous studies focusing on students' understandings of earthquake and they have shown that studentsat elementary and secondary level have negative feelings on earthquake and misunderstandings about definition of earthquake conceptdue to either their experiences or what they heard from media or people around them (Aydın, 2010; Aydın & Çoşkun, 2010; Aydın & Çoşkun, 2011; Kaya,2010).Hence, it can be claimed that courses including earthquake-related issuesfail to provide enough scientific information so that students cannot overcome their misconceptions about earthquake.

There is another research study conducted by Altay (2008) found similar results and concluded that social sciences course does not include earthquake-related issues sufficiently and teachers generally tend to use direct instruction method when they teach earthquake-related issues because direct instruction method is considered more practical and easier to use and it consumes less effort. Apart from these, time constraint, crowded classes and lack of pedagogical knowledge for innovative

teaching approaches also force teachers to use this method. Thus, this results in reducing interests of students in the topic.

Having said that, to address aforementioned deficiencies in relation to disaster education in Turkish education system, school-based disaster education project was being thought as an alternative for the current disaster education in Turkey. United Nations Educational Scientific and Cultural Organization [UNESCO] (2009) stressed the integration of disaster risk reduction integration within all levels of formal education, from the pre-primary through university, teacher training and the assessment of learning as three critical success factors for creating a safety culture through education. Therefore, within the scope of the project, master teachers from each project school participated in several trainings to conduct required knowledge about disaster-related issues and skills for effective disaster education implementation within the scope of this school-based disaster education project. They were encouraged to impart what they learned from the trainings to their colleagues and this provided teacher-teacher communication regarding disaster education, which means that teachers could feel more confident in the subject to teach disaster education to their students. By doing so, teachers werewell equipped on content and pedagogical knowledge to promote effective teaching process in relation to disaster-related education.

In this study, particular attention was paid to the assessment of the effectiveness of disaster education through extra-curricular activities. Dufty (2009) pointed out the lack of evaluation to measure of effectiveness of disaster education programs as a major weakness in the literature. Hence, this study makes contribution to the literature through investigating the impacts of renewed disaster education including extra-curricular activities withimmediate outcomes such as awareness, personal preparedness, home-based preparedness, and encouragement of child-parent communication by comparing it with current disaster education in elementary schools in Turkey.

In addition, making an external assessment provides policy makers to show possible consequences and impacts of the school-based disaster education through both curricular and extra-curricular activitieson students, teachers and parents

objectively and to assure accountability and transparency. This study attemptedto help policy makers make changes or revisions if it is necessary before moving from the pilot project to a thorough integration of disaster education through extra-curricular activities into national education system.

1.4 Definitions of Terms

Before taking the discussion further, it is useful to present some key working definitions under this section.

Disaster: Disaster is defined by UN/ISDR (2007) as a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources.

Hazard: Earthquakes, storms, and floods are natural phenomena referring as "hazards" and we can define the concept of the hazard as a dangerous phenomenon, substance, human activity, or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UN/ISDR, 2007).

Disaster Risk: Disaster risk can be seen as a function of the probability of hazard occurrence, which is defined as "the potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period" (UN/ISDR, 2007).

Vulnerability: UN/ISDR (2007) defines vulnerability as "the characteristics and circumstances of a community, or system that make it susceptible to the damaging effects of a hazard".

Disaster Risk Reduction: Disaster risk reduction (DRR) is aimed at reducing disaster risks through systematic efforts to analyze and reduce the causal factors of disasters (UN/ISDR, 2007).

Disaster Management: The main purpose of disaster management, which is also known as emergency management, is to deal with and avoid both natural and man-made disasters through activities and measures for prevention, mitigation and

preparedness. There are several principles of disaster management, which include using resources more sustainably, providing coordination between government and non-government organizations, obtaining the right knowledge about nature of environment, and so on (UN/ISDR, 2007).

Disaster Mitigation: The adverse impacts of hazards often cannot be prevented fully, but the amount of damage can be reduced or eliminated by various strategies and actions. Disaster mitigation is one of the aspects of disaster risk reduction. Disaster mitigation underlines the lessening or limitation of the adverse impacts of hazards and related disasters through structural and non-structural measures (UN/ISDR, 2007). Impacts of hazards often cannot be prevented fully, but the amount of damage can be reduced or eliminated by various strategies and actions. Disaster mitigation is one of the aspects of disaster risk reduction. Disaster mitigation underlines the lessening or limitation of the adverse impacts of hazardsand related disasters through structural and non-structural measures (UN/ISDR, 2007).

Disaster Preparedness: While disasters pose significant threats to people, the environment where they live and work, knowing the potential risks, anticipating them, and being properly prepared before, during, and after a disaster can make the difference between the total loss of a resource and limiting the resulting damage (UN/ISDR, 2007). As disasters may be unpredictable, important steps can be taken before a disaster occurs to minimize the threat of damage.

Curricular Activities: All activities carried out based upon the formal curriculum are considered as curricular activities.

Extra-curriular Activities: Extra-curricular activities can be defined as those implemented without the scope of a course and no grading is done at the end of them (Shulruf, 2010). Keser, Akar, and Yıldırım (2011) pointed out that extra-curricular activities couldcarry out after or during school programs, and both withinschool buildings or outside.

Disaster Awareness: Shiwaku et al. (2007) developed an awareness model including five levels: risk perception, intention to search information, searching information, intention to take measures and taking measures. In this study, disaster

awareness refers to knowledge about disasters, disaster risks, and disaster preparedness actions, the ability of a person to undertake disaster preparedness, and willing to take action.

CHAPTER 2

REVIEW OF LITERATURE

This chapter provides a basic introduction on disaster education, and it is divided into nine main parts. The first part classifies education into three modes, namely, formal, non-formal, and informal education, and provides an overview of disaster education through three different education modes. The second part emphasizes the importance of schools on disaster education, and gives a direction of school disaster education. The third part points out the content of disaster education from different countries, such as England, Japan, and Iran. The forth part includes six approaches to integrating disaster education into curricula and gives a clear picture of examples of implementation of disaster education in the various countries. The fifth part focuses on twopedagogical innovative approaches of disaster education, namely multiple intelligences learning theory and experiential learning approach. The sixth part examines nine interactive teaching methods used for disaster education through reviewing the related literature and provides specific examples of these teaching methods on disaster education, and shows the importance of using curriculum and extra-curriculum education forms through participatory learning approach. These methods in this part are named as school excursions, discussion method, teaching with cases, role-playing, games, international communication network, lessons by the guests, brainstorming, and emergency response practices. The next part discusses the necessity of systematic taxonomy of learning outcomes taken place in the disaster education and suggests a list including all dimensions of disaster education learning outcomes proposed by Selby and Kawaga (2012). The last part addresses a quick review of key points for successful disaster education reflecting personal judgments.

2.1 Disaster Education

2.1.1 General definition.

All over the world, each country is prone to disaster events either natural ones, such asearthquakes, floods, tsunamis, tornados, etc., or human-caused ones such as, fires, terrorist attacks, chemical abuses, wars, etc. As a result of an increase in the number of disasters, the cost of disaster recovery has been increasing year by year. Lastly, it has become essential that disaster risk reduction and management initiatives increase the capacity for reducing damages and losses caused by disaster events.

Many countries pregnant to disaster events have been developing various strategies in order to prevent or at least reduce negative impacts of disaster events that they face. A number of conferences, meetings, and frameworks have been held for discussing the possible and effective ways to cope with disaster events and to lessen or reduce their negative impacts. One of the most important suggestions for this global problem is that there is a need for knowledgeable and informed people, who have the ability to take particular measures for disaster preparedness and who have skills on how to survive on their own in case of a disastrous event. Hence, the need for creating a safe society reveals the importance of imparting necessary knowledge to people in order to develop disaster management skills, and to increase awareness about them.There is an assumption that education makes people aware, which causes changes in their attitudes and behavior properly (Handner, 1985).

In today's society, education plays a very significant healing role in people who have experienced emotional and social injuries as a result of a disaster event. Education can infuse a sense of emotional and social normalcy for affected people and serve as a platform for them to gain new life skills that are needed in times of disastrous events. It is believed that people who have gained useful knowledge and skills through qualified education are much better prepared to contribute to the process of rebuilding their own lives and even others' lives around them (Faupel, Kelley, & Petee, 1992). In the literature, there is a consensus on the definition of disaster education and it is defined as any learning process or activity that builds

community resilience to natural or man-made disasters (Dufty, 2008), aiming at reducing risk of and vulnerability to disasters through teaching people how they can best protect themselves, their property and their livelihoods from disasters (UN/ISDR, 2012).

2.1.2 Formal, non-formal and informal education.

Shaw, Takeuchi, Gwee, and Shiwaku (2011) classified education into three forms, formal education, non-formal education and informal education. Formal education refers to regular school education with structured learning objectives and learning time. Although non-formal education also includes organized and sustained educational activities, it does not have to be within the educational institution, such as school. It can take place outside of the school. On the other hand, informal education is not structured and not sustained by educational institutions although in most cases, it becomes unintentional. Informal education reveals as a result of daily activities.

Even they are different from each other, all three forms of education can be harmony with each other in practice. For instance, in addition to formal education provided by schools, schools can also organize non-formal education such as, extra-curricular activities. Apart from that, students are engaged in informal education throughout their lifetime, even before they start to go to school.

While, formal education on disaster risk reduction can be conducted as a part of some subject areas or through integrated intoall major curricula, some of them introduce non-formal education through co-curricular and extra-curricular activities. Fuhrman et al. (2008) and Petal and Izadkhah (2008) put forth that disaster education in almost any class situation, can be integrated into many subjects, including geography, history, economics, civics, social studies, language, arts, mathematics, science, physical education, health, and technology. For instance, in the Czech Republic education system, some aspects of disaster reduction are integrated into chemistry and physics courses curricula. Furthermore, geography course is thought as the most appropriate course for teaching disaster education in some countries, such as New Zealand, England, Australia, Iran, Serbia, Macedonia, etc. On the other

hand, especially in the United States, disaster and environmental education are embedded in the science curriculum (Lidstone, 1995).

As another approach for disaster education, some countries, such as Iran, Nepal, Russia, Macedonia, New Zealand, The Philippines, Turkey, USA, etc. integrated disaster-related issues into some or all major curricula for all ages. In addition to that, some countries, such as New Zealand, England, Japan, etc. introduce non-formal education through co-curricular and extra-curricular activities such as posters, drills, seminars, field trips, and museum visits in order to disseminate important knowledge, skills and competencies to students at varied different age groups (Sinha, Mahendale, Singh, & Hegde, 2007).

In addition, disaster education can be taught independently. In some countries, there exist specialized courses at specific grade levels, aiming at imparting necessary and in-depth knowledge to students in order to develop disaster management skills, and to increase awareness about them (Petal & Izadkhah, 2008). For instance, there is a specialized course on disaster management in secondary education in India (Sustainable Environment and Ecological Development Society [SEEDS], 2008), and in Japan. Maiko High School in Japan established a stand-alone course, namely "Environment and Disaster Management Course" in 2002 (Shiwaku & Fernandez, 2011). Moreover, In Slovenia, an elective course was introduced in 2009, named as "Protection against Natural and Other Disasters" in the last three years of primary education (Komac, 2010). As another example of stand-alone course on disaster management, French education system has a seven-hour course, Prevention-First Gestures, for pre-school, primary and secondary students (Sinha, Mahendale, Singh, & Hegde, 2007). However, Petal and Izadkhah (2008) pointed out that it becomes more meaningful when the entire school population is involved in the disaster-related education process, which is not the case of stand-alone course.

Petal and Izadkhah (2008) explained that curricular and extra-curricular education should be integrated for ensuring disaster resilient communities. They came up with many different forms education in disaster risk reduction. They highlighted that integration of extra-curricular activities within the school formal curriculum enriches the learning process corresponding to disaster risk reduction.

Similarly, Lindstone and Nelson (1999) also emphasized that although curricular education is the key to providing basic knowledge related to the subject, extra-curricular education is incontrovertible underpinnings that increase the capacity to address disaster risk reduction measures. It can be used as a complement and supplement to curricular education.

Disaster education policies, international and national initiatives will be addressed in the next section since the importance of disaster education in disaster risk reduction has been examined in many international agendas, conferences and frameworks that have played a pioneer role in taking initiatives about disaster education projects.

2.2 Disaster Education Policies

Disaster risk in one region has an impact on risks in another region, which causes disaster-related issues to have a global concern besides national and local one. Therefore, disaster risk reduction strategies and systems have been integrated into policies, plans, and programs, as well as regional and international collaborations have been made to support mutually for the purpose of reinforcing the resilient communities (Hyogo Framework for Action [HFA], 2005).

Through international agendas, conferences, and meetings, disaster education has been stressed as one of the most important ways for reducing vulnerabilities and building the resilience of communities to disasters. The next part analyzes briefly an international disaster management framework, namely HFA, especially disaster education as its third priority for reducing vulnerabilities to disasters of communities, and its practices to advance disaster risk awareness and management at schools.

2.2.1 Hyogo framework for action 2005-2015.

HFA adopted at the World Conference on Disaster Reduction (WCDR) held from 18 to 22 January 2005 in Kobe, Hyogo, Japan, provided a unique opportunity to develop and implement disaster reduction strategies for reducing vulnerabilities and risks to hazards from a global perspective. It highlights the need for building the

resilience of nations and communities to disasters. It is organized around five main Priorities for Action (HFA, 2005, p. 6):

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.
2. Identify, assess and monitor disaster risks and enhance early warning.
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
4. Reduce the underlying risk factors.
5. Strengthen disaster preparedness for effective response at all levels.

When we examined the key activities of HFA Priority 3, it highlights the important role of using knowledge, education, and innovation in increasing awareness through formal and non-formal channels of education under four sections, which are information management and exchange, education and training, research, and public awareness. Within the scope of the study, education and training section will be given Table 2.1 below. It attaches great importance to education focusing on disaster risk reduction in schools and gives proper directions to guide them in order to ensure the effectiveness of the programs on disaster risk reduction measures.

Table 2.1 *Key Activities of HFA Priority 3 (Education and Training)*

(a) Promote the inclusion of disaster risk reduction knowledge in relevant sections of school curricula at all levels and the use of other formal and informal channels to reach youth and children with information
(b) Promote the implementation of local risk assessment and disaster preparedness programs in schools and institutions of higher education
(c) Promote the implementation of programs and activities in schools for learning how to minimize the effects of hazards
(d) Develop training and learning programs in disaster risk reduction targeted at specific sectors (development planners, emergency managers, local government officials, etc.)
(e) Promote community-based training initiatives, considering the role of volunteers, to enhance local capacities to mitigate and cope with disasters
(f) Ensure equal access to appropriate training and educational opportunities

Practices of HFA.

In the light of the key activities of HFA Priority 3, there was the 2006-2007 UN World Disaster Reduction, on "Disaster risk reduction begins at school" developed by UN/ISDR and its partners UNESCO, UNICEF, IFRC, and Action-Aid and it was mostly focused on integrating disaster risk management into school curricula. By doing so, many educational materials, booklets, posters, handbooks, textbooks, and school projects were developed through this campaign, reaffirming the priority for action 3 of the HFA. Within the scope of this campaign, there were five case studies included Cuba, Kazakhstan, Madagascar, Afghanistan and India, which are all heavily exposed to natural hazards, such as floods, earthquakes, tropical cyclones, sand storms, etc. Each country has made a project related to disaster risk reduction through education in schools. Disaster risk reduction activities involve training sessions for teachers, students, administrators, and community members; preparing brochures with explanations for what to do in a disaster event; non-fiction educational movies and educational cartoons on natural hazards; educational modules for students including computer presentations, resource materials, and video clips. There were several lessons learned from those cases:

1. Education, especially school and formal education, is one of the most effective ways of disaster risk reduction and empower local communities' awareness, knowledge and skills through preparedness and mitigation activities against the effects of disasters.
2. Students become aware of their crucial role in the society regarding disaster prevention and management.
3. Family and community education help students develop a culture of disaster preparedness.
4. School education should include non-formal activities such as school clubs, practical activities, drills, etc. that help to improve required skills rather than mere knowledge.
5. Disaster risk reduction would construct more resilient schools buildings since school buildings can be used temporary shelters after a disaster strikes as well as school buildings are needed to be safe for children and for the

continuation of education (UN/ISDR, 2006).

2.2 Role of Schools in Disaster Education

Research studies have shown that schools have an important role in spreading knowledge related to disaster events, their causes, possible impacts, and actions for protecting from their impacts through disaster education. In the literature, there are five basic reasons for paying attention to the importance of disaster education in schools (Johnston et al., 2011; Shaw & Kobayashi, 2001; Shiwaku & Shaw, 2008; Yasamin & Izadkhah, 2008).Reasons of stressing important roles of school in disaster education will be addressed below.

The first and main reason is that children are seen as one of the most vulnerable populations after a catastrophic event. When a disaster strikes, children are the worst victims who suffer physically and psychologically and many of them are injured, separated from families, and without any shelter (UNICEF, 2012). They are mostly reliant on adults to protect themselves. Children need to be protected or to be told what to do to be better prepared when a disaster strikes whereas adults have more control about preparation physically and emotionally against disasters(Hosseini & Izadkhah, 2006; Finnis, Standring, Johnston, & Ronan, 2004; Ronan & Johnston, 2001; UN/ISDR, 2006). Disaster education programs at schools are intended to reduce children's vulnerabilities and facilitate their personal resilience. Knowing disaster related issues and appropriate protective behavior help children have the power to respond to them. Therefore, it is necessary to ensure that children are well equipped with sufficient knowledge of hazards such as, types of hazards, frequencies of occurrence, of what happens, and of how to prepare against their negative impacts. If children can act independently during a disaster, and if they can help others who are unaware of the correct actions to take, depending on age, their families' vulnerabilities will decrease and this helps to increase the resilience of their community since family is the core of a community (Finnis et al., 2004; Ronan & Johnston, 2005).

Secondly, one of the requirements of becoming a sustainable society is to build a safe and resilient culture at all levels, including government, business, industry, and the general public, and especially children. Children are our future.With the appropriate support and guidance, children can develop skills and resiliency needed to deal with and overcome the impacts of disastrous events. They have the inherent potential for being resilient with adequate support. Therefore, it is extremely important to train our children in disaster risk reduction for creating a sustainable and resilient culture against future catastrophic events.

The following reason for giving importance to school disaster education is about transferring knowledge provided at school from children to parents and community members. It can be said that children are vectors between community and schools. Through disaster education, children can build great awareness of disaster issues. Children who educated well about disaster-related issues can be pathway to increase preparedness at home. The more a child is educated and encouraged to share information, the more there exists the potential for caregivers to be better informed (Cardona, 2007; Finnis et al., 2004; Hosseini&Izadkhah, 2006; Ronan & Johnston, 2001; Ronan&Johnston, 2003; Shiwaku&Rajip, 2008; Tanaka, 2005). This is a mutual interaction between children and their parents for being prepared at that time. The underlying assumption of the fact that if we teach students, they will teach parents should not be ignored.

Children who take hazard education perceive risks realistically, are capable of reducing fears, and are capable of behaving appropriately for protecting themselves and people around them. Children who are encouraged to share what they have learned from hazard education programs with their parents have an important impact on hazard adjustment at home based. Therefore, hazard education should provide the opportunity for increasing frequency of connection between children and their parents about what they have learned about disaster preparedness. The more children are involved in hazards education programs, the more they and their parents derived benefits (Cardona, 2007; Finnis et al., 2004; Hosseini&Izadkhah, 2006; Ronan & Johnston, 2001; Ronan&Johnston, 2003; Shiwaku&Rajip, 2008; Tanaka, 2005).

Fourth, schools are key elements not only in disaster management with respect to raising awareness of hazards, but also for providing emergency shelters in times of disaster events. Therefore, safety of school buildings becomes crucial to ensure the safety of children and community members during a disaster event as well as the continuation of education after then. However, the scope of my study was limited only to non-structural measures for disaster risk reduction. That is why did not provide detailed information about structural measures for disaster risk reduction.

Finally, several research studies in the literature reveals that school disaster education leads to heightened awareness but does not make students take desired actions for disaster risk reduction or to respond properly to disasters (Ronan, Johnston, Daly, & Fairley, 2001; Ronan &Johnston, 2003; Shiwaku, Shaw, Kandel, Shrestha, & Dixit, 2007). In addition to school formal education, including community and family level education helps students develop a culture of disaster preparedness more efficiently (Finnis, et al., 2004; Shaw, Shiwaku, Kobayashi, & Kobayashi, 2004). We can claim that schools also play an important role in community training in order to empower community members against disaster events (Johnston, et al., 2011; Shaw & Kobayashi, 2001; Shiwaku & Shaw, 2008; Yasamin & Izadkhah, 2008). Patonand Johnston (2001) suggested that in order to both raise awareness of risk perceptions and desired preparedness actions for risk reduction, communities should be included in disaster education. The director of UN/ISDR, Salvano Briceno underscored the importance of schools and mentioned “likewise schools make the difference between despair and hope, they can make the difference between life and death” (UN/ISDR, 2007).

2.3 Content of Disaster Education

The content of disaster education is far from uniformity. In many countries, such as New Zealand, England, Australia, and Iran geography course isseen as the most appropriate course for teaching disaster education. On the other hand, especially in the United States, disaster and environmental education are embedded in the science curriculum (Lidstone, 1995). Furthermore, Fuhrman et al. (2008)

claimed that disaster education in almost any class situation, can be integrated into many subjects, including geography, history, economics, civics, social studies, language, arts, mathematics, science, physical education, health, and technology. They emphasized that disaster preparedness education should enable students to utilize spatial thinking and decision-making abilities in case they face a disaster. They paid attention tospatial thinking as a key component in developing survival strategies during a disaster.Committee on Support for Thinking Spatially (2006) stated the linkage of spatial thinking to three key factors as concepts of space (such as distance, and direction), tools of representation (such as maps, and graphs) and the process of reasoning (such as cognitive strategies to facilitate problem-solving and decision- making).Therefore, one of the major goals of disaster education should be to enhance spatial thinking skills of students since spatial thinking plays vital role in minimizing difficulties and challenges that people may encounter in the times of disastrous events (Bednarz & Bednarz, 2008). Geographic Information Systems (GIS) is one of the interactive technological tools used in schools to promote students' spatial thinking and decision-making skills at secondary level (Mitchell, Borden, & Schmidtlein, 2008). However, there are some pre-requirements for using GIS, such as hardware and software requirements, teachers' requirements to develop pedagogy to teach with this tool, etc. (Bednarz, 2004). Alternatively, Fuhrman et al. (2008) reviewed several useful Web-based resources including interactive spatial graphics about disasters.

The content of disaster education in many countries is mostly focused on the major natural disasters that have been experienced (Sinha, Mahendale, Singh, & Hegde, 2007). Turkey is one of these countries, which pays more attention to earthquake preparedness because earthquake is the major natural hazard in the region. In a similar way, since Iran is an earthquake-prone country, it has developed earthquake education at the K-12 level on a national scale (Petal & Izadkhah, 2008). As another example, Australia gives importance to teach the fire risk reduction and mitigation strategies, referring to Australia's worst fire at primary and secondary level (Sinha, Mahendale, Singh, & Hegde, 2007). On the other hand, several countries, such as New Zealand, Madagascar, and Lao PDR bring natural hazards

and man-made and technological hazards together in their disaster education (Selby & Kawaga, 2012). Correspondingly, Mitchell (2009) proposed that the ideal way to identify disaster education content is to make an analysis of the potentially threatening physical events of the community and its social structure. In addition, a number of other factors that influence the creation of ideal disaster education include allocated time, teachers' own educational background, the ways of disaster education is taught, such as through integration or infusion of disaster education into major subject areas, through extra-curricular activities, etc., and students' ages.

A number of research studies confirmed that disaster education should be a part of primary and secondary formal education (Johnston et al., 2011; Shaw & Kobayashi, 2001; Shiwaku & Shaw, 2008; Yasamin & Izadkhah, 2008). On the other hand, according to Mitchell (2009), the most appropriate time to provide disaster education is the K-12 level (Kindergarten through 12^{th} Grade). Today, as shown in several examples around the world such as in the Czech Republic France, Iran, and Russia, disaster education begins in the early years of school at basic level, in the pre-primary school level and continues into secondary school because this period is essential regarding to human cognitive development.Kindergarten children can develop their psychomotor skills and learn how to control their bodies through pre-school education. They can learn emergency telephone numbers through games and stories. As an example, the basic information about disasters and responsive behaviors to disasters are provided to kindergarten children in the Czech Republic (Wisner, 2006). Komac (2010) stressed that education at the early ages focuses more on the development of the mind and ability to understand and to think and he argued the emphasis on university education regarding disaster education and found it less important because at this age people already built their minds and are already aware of environmental issues and have habits relevant to the environment.

In the literature, some countries such as Japan and USA introduce disaster education based on *independent approach* or *separated approach*, which addresses one hazard risk as a separate subject matter (Shiroshita, Kawata, &Collins, 2012). Iran also can be an example of independent approach. Earthquake-related education in Iran is taught separately and is given more importance, as it is prone to

earthquakes. On the other hand, The British education system focuses on various risks within more broad and inclusive framework. This can be an example of *holistic approach* to disaster education (Shiroshita, 2008).

2.4 Approaches to Integrating Disaster Education in the Curriculum

Selby and Kawaga (2012) identified six different approaches to integrating disaster education in the curriculum by examining thirty countries: textbook-driven approach, pilot project approach, centralized competency-based approach, special subject approach, symbiosis approach, and special event approach. Each approach is reviewed below.

2.4.1 Textbook-driven approach.

Teachers generally use textbooks identified Ministry of Education as the main medium of instruction. Many new teachers follow textbooks of particular subjects as a main resource of the instruction and present all chapters in the books in the order as they are arranged. This leads to develop a course that is textbook-driven. Therefore, this approach is highly centralized and ensures that disaster-related topics within identified subjects in all state schools are presented.Although this seems to be a safe way for teachers and to be a usual way in the countries where textbook culture already exists to teach, teachers may find many things about the textbook that they need to adjust based upon their approaches to the curriculum.Even in some cases, there is an urgent need to appeal to other resources apart from textbooks. Altay (2008) investigated that teachers generally use textbooks as the main resource while they teach earthquake-related issues. However, they clarified that textbooks do not involve sufficient information about earthquake-related issues, which makes earthquake education difficult. In addition, because the concept of earthquake is an abstract concept, even teachers have difficulties to understand it and this makes more difficult to impart the knowledge to students, particularly at early ages. Therefore, they need to look for other resources and use other materials rather than textbooks to promote better earthquake education.

There is no challenge for teachers to understand their traditional role in the textbook-based classroom, but this culture has some downsides for students(Selby & Kawaga, 2012).First of all, this approach encourages passive learning and inhibits interactive and participatory learning, which is seen as the most successful way of developing necessary skills and safe behaviors for disaster preparedness and mitigation. Secondly, since this approach is generally offered centrally, this leads to occur “one size fits all” approach, which is conflict with the idea of every child has different abilities and needs that affect their learning and every child has different ways of learning that help them develop their strengths and overcome their weaknessesAccording to the report that was prepared by UNICEF and UNESCO (2012), Bangladesh and Nepal offer disaster-related curriculum based upon textbook-driven approach. As an example, disaster-related subjects are integrated into particular course textbooks such as social studies, science, language, and in the population and environmental education.

2.4.2 Pilot project approach.

According to Selby and Kawaga (2012), this approach usually involves several phases of pilot implementation of new learning materials, new pedagogies, and innovative ways of assessment, etc. in the limited number of schools. Pilot projects may be sponsored and organized by local or international non-governmental organizations, in some cases, in line with the communication of government. There are several countries in which disaster risk reduction have been integrated to education through pilot projects, such as Turkey, Madagascar, Nepal, Armenia, Kazakhstan, France, etc. While pilot projects in some countries, such as France, are widely replicated and become part of the national disaster risk reduction, some national pilots, such as Armenia, are still waiting for replication or finishing. Even when they end, they do not result in substantive curriculum change. In some cases, the outcomes of the pilot projects may stay passive to move to national scale due to lack of available financial resources.

2.4.3 Centralized competency-based approach.

There are three basic steps to be followed for this approach. In the first place, government working with key stakeholders identifies key concepts, knowledge and,

especially, key competencies and skills to be integrated into the particular curricula. The next step is to develop module, materials concerning the carrier subjects for specific grade level and teacher trainings. Then, the final step is to experience and evaluate the modules, materials and methods decided before for making students to gain identified core competencies whether expansion to further carrier subjects and grade levels is laid out or alternative decisions and actions are made. It is an advantage of this approach that government initiates such curriculum development process, which results in quick implementation, large-scale piloting and evaluating, and rapid movement to scale. On the other hand, focusing on just competencies and rapidly development also emerge some key aspects of disaster-related curriculum development, such as pedagogical development, ethical concerns, etc. to be brushed over. The Philippines is an example country in which disaster risk reduction education is developed based upon the centralized competency approach (Selby & Kawaga, 2012).

2.4.4 Special subject approach.

As mentioned before, according to this approach, a stand-alone course is created entirely for disaster risk reduction education within the formal curriculum. Paying special attention to disaster-related subjects through a distinct course makes a good impression that disaster risk reduction education is an important part of the formal education. On the contrary, the limited number of students at specific grade levels finds a chance to learn disaster-related subjects through this stand-alone course. It could take time and effort to provide well-qualified teachers that can teach this new created subject and can use and develop teaching materials and assessment methods. As another downside of this approach, dedicating a special course for disaster-related education can lead to inhibit further efforts to integrate disaster-related education into related themes and topics in another curriculum. Georgian and Russian education system have such dedicated subject for disaster risk reduction education, in both which also infuse disaster-related subjects into a number of subjects (Selby & Kawaga, 2012). The next part discusses one of these cases that promote students' active involvement, which is Environment and Disaster Mitigation

Course in Maiko High School in Japan. It has established based upon experiential learning approach.

Environment and disaster mitigation course in Maiko high school.

Suwa (2003) examined the role of schools in disaster risk reduction measures in Japan and gave a good example of disaster education implementation. After the Kobe earthquake in 1995, the education board formed a new direction of disaster education and established special courses for disaster preparedness and mitigation. Maiko High School established an "Environment and Disaster Mitigation Course" (EDM course), creating a co-learning environment for students with the purpose of promoting self-education processes. The main purpose of the course is to raise citizens with disaster mitigation literacy, consisting of these important factors, which are fundamental knowledge, fundamental skills to cope with the disasters and a strong willingness to take action to reduce risks and contribute to the society for building resilience to disasters. Shiwaku and Fernandez (2011) highlighted that the course is the first of its kind at the high school level in the world and claimed that students taking this course have the capability to make small changes in their own lives to better overcome disasters without relying on others. Shiwaku and Shaw (2008) evaluated the effectiveness of the EDM course and revealed that the EDM course encouraged students get involved in the context of disasters, and to take notice their roles in the dynamic physical environment that they live. They were also aware of their responsibilities and actions for their own preparedness. Therefore, more concentrating on this school disaster education course and its basic principles can give the advantage of providing a chance to understand how school disaster education should be implemented.

Shiwaku and Fernandez (2011) discussed the EDM course in detail. The essential principles of the EDM course are followed as:

- Disaster mitigation education is based upon previous experiences from the Great Hanshin- Awaji Earthquake. The importance of life, students' power against disasters, and their contributions to the society are paid attention.
- Learning both mechanism of natural phenomena and the relationship between disasters and societies should be understood deeply.

- The main purpose of the course is to make students enable to take actions independently. To achieve this, a slogan is created, namely “Think Globally, Act Locally”.
- Disaster mitigation education should be applied through experiential learning. For this purpose, volunteer people from universities, research institutes and many other relevant organizations make cooperation with the school. Visiting museums, fieldworks on the natural environment, participating in the training for firefighting, and volunteer activities in affected areas are some of education programs taking place in the EDM course.

The EDM course is based on a holistic approach to disaster mitigation. It includes information about what to do before, during and after a disaster strikes. Apart from that, learning how to protect of the natural and social environment is also a part of the course content. The crucial point is proactive co-learning experiences of students by focusing on field exercises. For instance, a fieldwork on Mount Rokko is arranged in order to examine the linkage of natural and built environments. In order to understand deeply earthquake mechanism, visits to the Nojima Fault Conservation Center and The Nojima Fault Museum is arranged within the scope of the course curriculum. Furthermore, students are actively involved in the curriculum development and learning process. They developed the curriculum of the course with their teachers and they find lots of opportunity to take action based on what they learned in the course. They learn many different aspects of disaster management through ongoing subjects and activities on disaster preparedness and mitigation measures. For instance, they experience several trainings in the school for firefighting. They learn how to rescue from the rubble, how to cook outside, how to use fire extinguisher, etc. Activity-based learning inside and outside of the school promotes students’ understandings of the environment and disaster mitigation through experiential learning. Moreover, many guests are invited to the school to talk about their experiences during and after the disaster that they faced, which makes students realize and be aware of the importance of human lives and encourage them to help each other. In addition, problem-based learning activities are set to facilitate students’ gain of comprehensive abilities, interest, and techniques. Students solve the

potential challenges on their own in cooperation with other students in these problem-based tasks and use computers and the Internet to make a report, prepare a presentation, or get necessary information.

2.4.5 Symbiosis approach.

In some cases, disaster risk reduction education is embedded in existed cross-curricular dimensions, such as Life Skills, Civic/Citizenship education, environmental education, and education for sustainable development. In that sense, mostly it is a relatively easy matter to associate disaster risk reduction to these cross-curricular dimensions. In most cases, disaster-related education is combined with environmental education as in Madagascar, Costa Rica, Cuba, Nicaragua, and Peru. Recently, climate change is acting as a carrier for disaster risk reduction; for instance in some African countries. These dimensions provide in-depth understanding of the purposes and scope of disaster risk reduction education. However, there is a danger that the purposes and essentialities of disaster risk reduction among these cross-curricular dimensions may become lost or under-valued. The key concepts and points may lose their meanings and foci in a broad sense (Selby & Kawaga, 2012).

2.4.6 Special event approach.

As an extra-curricular activity given in the previous section, organizing special disaster risk reduction events offers additional and supportive space for students to be active in disaster risk reduction learning and makes contribution to develop school and community partnership. In addition, this approach can provide a supplementary environment for disaster risk reduction learning in case teachers feel themselves overloaded and they do not address disaster-related subjects into overcrowded curriculum. There is a National Disaster Awareness Week in schools in Fiji, which can be given as an example for the special event approach. There is a cautionary note concerning that the special event as should be combined with the curriculum, teaching and learning developments. It is used as a catalyst and has a supplementary influence on formal curriculum (Selby & Kawaga, 2012).

2.5 Pedagogical Innovations of Disaster Education

Petal (2009) suggested that disaster risk reduction (DRR) education should encourage both children and adults to discover their own power to mitigate damages posed by disasters. DRR education should serve not only to convey understanding of natural and environmental conditions and the human actions and inaction that cause the disaster but also encourage them to make changes in their behavior. In the literature, there are two major pedagogical theory associated with disaster education, which are multiple intelligences theory and experiential learning theory. In the next section, these theories are addressed in detail.

2.5.1 Multipleintelligences theory. According to Gardner's (1999) multiple intelligences theory, every individual has nine different kinds of intelligences with different levels and forms. These nine intelligences have different ways of interacting with and learning from the world. Based on multiple intelligences theory when learners personalize what they learn, and discover the important points of the subject, they are more motivated to make progress on their own within the context.

These multiple intelligences are described below:

1. ***Linguistic Intelligence:*** According to Gardner and Hatch (1989), linguistic intelligence is defined as sensitivity to the sounds, rhythms, meanings of words, and different functions of languages. People who have linguistic intelligence possess well-developed verbal skills. They can easily use language to express their feelings and ideas. Journalist, writers and poets have high levels of linguistic intelligence.
2. ***Logical-Mathematical Intelligence:*** Gardner and Hatch (1989) described logical/mathematical intelligence as the ability to think conceptually and abstractly, and capacity to discern logical and mathematical patterns and operations. Scientists, mathematicians and logicians possess high levels of logical/mathematical intelligence.
3. ***Musical-Rhythmic Intelligence****:* Gardner and Hatch (1989) claimed that musical-rhythmic intelligence is the ability to produce and appreciate musical

patterns such as rhythm, tone and pitch. Composers, violinists, singers and musicians have high levels of musical-rhythmic intelligence.

4. ***Bodily-Kinaesthetic Intelligence:*** Gardner and Hatch (1989) identified bodily-kinaesthetic intelligence as the ability to control one's body movements and to handle objects skillfully. Dancers, athletes, actors, surgeons, mechanics and other technicians possess high levels of bodily-kinaesthetic intelligence.
5. ***Spatial Intelligence:*** Gardner and Hatch (1989) described spatial intelligence as the capacity to recognize the visual patterns accurately and abstractly. Navigators, sculptors, and architects have high levels of spatial intelligence.
6. ***Naturalistic Intelligence:*** Gardner (1999) described naturalistic intelligence as the ability to recognize and categorize objects. Hunters, farmers and gardeners have high levels of naturalistic intelligence.
7. ***Intrapersonal Intelligence:*** Gardner and Hatch (1989) identified that an individual who have high levels of intrapersonal intelligence has the capacity of self-aware, to access to his/her feelings, values, beliefs, and use them to guide his/her life.
8. ***Interpersonal Intelligence:*** According to Gardner and Hatch (1989), an individual who is high in interpersonal intelligence has the capacity to detect and respond appropriately to the moods, motivations and desires of others. Therapists, salesmen, teachers, politicians, and clinicians have high levels of interpersonal intelligence.
9. ***Existential-Moral Intelligence:*** Although Gardner pointed out that there is not any neurological evidence of biological existential ability as a separate intelligence; the presence of this ninth intelligence was accepted. It can be defined as sensitivity and the capacity to tackle deep questions about human existence, such as the meaning of life, why are we born, why do we die, and how did we get here.

Sharpe and Kelman (2011) suggested the application of multiple intelligences theory to disaster-related education for secondary schools in England.They paid attention to use a range of educational resources, often internet-based, for matching

the individual learning styles on disaster-related education. Teachers can create such learning environment that students enable to develop a better understanding of main points of disaster-related educationin a funny kind of way. They can apply different approaches to teaching by observing how students can learn in the classroom, assuming that each student has different learning style. Then, students can easily be motivated to learn when learning activities are caught their interest.Table 2.2 (see Appendix A) gives examples of some learning activities on disaster-related education linked with multiple intelligences, categorized by Bloom's taxonomy.

2.5.2 Experiential learning theory. Experiential learning is aimed at promoting a more participatory and learner-centered approach with more direct engagement and rich learning environments, which enhance the construction of meaning by learners (Kolb, Boyatzis, & Mainemelis, 1999).

Previous experiences have shown that disaster education is more successful when learners play active roles in the context of disasters. Therefore, disaster education should be more than teaching natural hazards through textbooks and lectures. It should provide such learning environments that learners cultivate their own powers to reduce negative impacts of disasters. Learners need to realize that their actions and inactions can lead to trigger a disaster. To achieve this, disaster education should emphasize the direct link between natural and social environments and learners should pay attention to that the balance between these environments should be protected to reduce disaster risks.According to Lidstone (1996), learners behave properly to prevent adverse effects of disastrous events when they feel that they are a part of that dynamic physical environment.

It is widely acknowledged that project-based learning is one of the teaching methods of disaster education based upon participatory and learner-centered approach. An example is given of an online intercultural project developed at a high school in Hyogo in 2005 to commemorate the 10th anniversary of the Hanshin-Awaji Great Earthquake, with the purpose of informing people all around the world about disasters by telling about their own experienceswith the earthquake. This led to changes in awareness of and attitudes toward disaster reduction. Students noticed

what their friends experienced during and after the earthquake and this helps them to be better prepared (Naya, 2007).

This experiential learning theory could go further by giving examples of how students enable to change in their attitudes and behave accordingly in disaster risk reduction. Other major activities that have influence on better dealing with disasters are evacuation drills, having skills such as, first aid to care for oneself and others, the creation of go-bags, and having a family and school evacuation plan including contact information of each other in case a disaster occurs when the family is separated. In the next part, interactive teaching methods of disaster education based upon participatory approach will be addressed.

2.6 Interactive Teaching Methods of Disaster Education

Teachers can use different methods of teaching disaster-related issues. The important thing is to deliver necessary information fully and in a qualified manner considering different age levels. Previous studies showed that when disaster-related issues is taught through amusing methods and means, children do not feel fear of these sensitive issues (Izadkhah& Heshmati, 2007). According to Suwa (2003), disaster-related issues can be learnt through practical experience in its best way. Therefore, teaching methods providing such an environment that children can experience various thingsthrough a practical and an amusing way should be part of disaster education. In this part, nine interactive teaching methods of disaster education are stressed and examples are given in order to clarify each method and illustrate how to teach disaster-related topics through these innovative techniques.

2.6.1 School Excursions / Fieldtrips.

School excursion, in other words field trip, is considered as an interactive teaching method, which gives opportunity for students to get out of the classroom and experience various new things at first-hand. There are a number of advantages of field trips as a teaching method.

In the first place, it helps students connect theoretical information with the real world. It facilitates the learning of abstract concepts and makes them more tangible and memorable (Michie, 1998).

Secondly, students who go on the field trips find learning fun on their field trips and enjoy field trip lessons more than class lessons Teachers generally use field trips as extra-curricular activities to support and extent formal curriculum. Since field trips are usually enjoyable and special learning experiences, they attract students' attention, interest and curiosity, which leads to increase their motivation for learning (Leatherbury, 2011).

Numerous research studies especially in environmental education have documented significant increases in understanding conceptual information after participation in well-planned field trips. Nature-based learning experiences foster application of theoretical knowledge in the field and discovery of real life examples (Ballanytne & Packer, 2002; Hamilton-Ekeke, 2007). Moreover, these nature-based learning experiences offer an engagement emotionally with environmental issues and problems. Students feel sensitive to environmental issues. They, in turn, take responsibility to rescue natural areas (Ballanytne & Packer, 2002).Furthermore, field trips enhance the development interpersonal relationships between students and students, students and teachers (Lai, 1999).

As an example for school excursion on disaster education, Suwa (2003) reported several features of environment and disaster mitigation course implemented in Japan and one of the educational activities held in the course is studies outside of the school. Students visit disaster-related museums, institutions, natural parks and disaster-prone areas to gain more theoretical information and to investigate environmental problems that people living that areas faced, to observe earthquake faults, the dangerous streams of debris flow, and the raised bed rivers, and to benefit from experiences of victims. They visit the fire department in the city to develop fundamental skills of disaster mitigation and to have a chance to apply what they learned from disaster education in the field.

2.6.2 Discussion.

Evens (2010) describes the discussion methodas one of the interactive teaching methods that emphasize participation, dialogue, and two-way communication. Students can find chances to express their opinions and ideas about a topic, an issue, or a problem. It is thought that if properly planned and structured, discussion method is a useful tool for developing higher-order thinking skills, such as analysis, synthesis and evaluation (Ratiani, et al., 2011).

Larson (2000) highlighted the advantages of using discussion method and suggested that learners are active participants rather than passive recipients in the discussion. In addition, participants should support their ideas with evidences. This shows the necessity of preparation before discussion sessions.

Discussion method increases students' motivation for learning because they try to obtain related information independently in order to prepare for the discussion. Moreover, they find opportunity to expand their understanding of a topic through information that is provided by other participants. Following from these upsides of using discussion method, it permits an open interaction between student and student as well as between teacher and student. It encourages students to view things in different perspectives through presenting alternative ideas about a topic (Rahman, et al., 2003).

There are several criteria for productive discussion. Firstly, the topic that chosen for discussion should be open to dispute and teacher should ask probing questions that help students elicit their interpretations and opinions about the issue.

Secondly, the topic should attract students' attention and interest in order to promote effective classroom discussion. Students' level of difficulty should be taken into consideration when the topic is chosen. This facilitates their participation in the discussion. There is an evidence that when the topic of the talk is interest to the students, they engage intellectually in the discussion; hence, students develop deeper understanding of the topic and they create connections between topic and concepts rather than memorize facts (Larson, 2000). As students build the knowledge, the main role of teacher is to monitor inaccurate comments and direct them to find accurate and correct information.

That being said, disaster-related topics can be taught effectively through this method. Teachers can expose students to multiple perspectives through classroom discussion. Öcal (2003) claimed that developing discussion sessions about natural disasters and protection ways from them, especially in the social science course, help students be sensitive to problems that they can face in their lives. He gave several examples of the ways to use discussion as a teaching method for disaster-related education and he emphasized that the topic that is chosen for discussion should expose different points of view, which are compared and contrasted with others. Similarly, Rahman, et al. (2003) stressed the importance of discussion method and stated that it is one of the most widely used and valuable method in the teaching of social studies.

2.6.3 Teaching with cases.

The case method is defined as a teaching strategy which enables students to apply their knowledge to solve real-life situations (Gallego, Fortunato, Rossi, Korol, & Moretton, 2013)**.**It can be claimed that any kind of subject matter can be addressed through this methodology. However, in certain disciplines, such as Education, Medicine, Law, Engineer, Business, etc. it has been mostly utilized since teaching with cases is considered as a powerful teaching strategy that provide a rich learning environment to students for developing critical thinking, communication, problem-solving and decision-making skills (Grant, 1997). Cases can be stories, real events, situations, data samplings, or statements that present unresolved or provocative issues, situations, or questions. The information contained in a case should be enough to make it credible but there should be more than one solution for it in order not to limit students' explorations (Gallego, et al., 2013).

Davis and Wilcock (2003) pointed out several merits of teaching with case studies as followed:

- Teaching with cases allows students to apply information and concepts learned in lectures and help students make abstract concept more concrete.
- Because cases are usually real world problems or situations it becomes easy to make connection between theory and practice.

- Working on the cases forces students to make research, to use multiple resources and to improve information literacy.
- Case method is effective for developing interpersonal and communication skills while working in groups.

Grant (1997) mentioned distinct levels of teaching with case studies. In order to create an effective case study, in the first place, teachers should address one issue or problem that match specific course objectives to be accomplished so that students can apply knowledge learned from the course into scenarios. After case selection, teachers should inform students about and clarify what is expected of them and their responsibilities for discussing the case that was picked before in the class. In order to make case be clear and to give a sense of major issues to be discussed, some probing questions can be prepared. If the case is worked in groups, teachers should monitor students to make sure everyone is involved in the work. After students sort out relevant facts and draw some logical conclusions, they need to present to their friends and to the teacher either in an oral or a written way.

According to Öcal (2003), earthquake education can be taught effectively with cases. Teacher can use cases either in order to attract students' attention to the topic at the beginning of the lesson or at the end of the lesson or teacher can assign a case as a homework at the end of the lesson to encourage students to make some research about the case.

2.6.4 Role Playing / Drama.

Another useful and effective teaching method based upon active learning philosophy is role-playing. Chelilah (1985) defined role playing as a hypothetical or real particular situation where the participant is expected to assume a new identity and react to the details of the situation Participants acts and reacts according to his/her role based upon some basic information about the topic or issue. It is expected that participants can gain better sights into the situation and the process enhances human relations.

According to Oberle (2004), students can enable to discover "real-world" through role-playing activities. He emphasized the importance of role playing especially in geography education and reported that educators have great success

when they incorporate role-playing activities into their geography classes. He conducted a case study in order to evaluate the effectiveness of role-playing activity on college students' understanding of the geography topics. It was revealed that the role-playing activity increased students' understanding of the topics and their awareness. He concluded that role-playing is easily transferable to other geography classes and can be modified for other students' levels.

Chelliah (1985) suggested that role-playing activities can help to humanize the whole learning and behavior change process as an essential component of environmental education. However, he paid attention to the problem in the role playing situation has to be suitable to the maturity and level of understanding of the students.

2.6.5 Educational Games.

In order to engage students and improve learning process teachers need to inventnew ways that students can have interest in and enthusiasm for learning.One of the most effective ways for engaging students in the learning process is using games for educational purposes.

The ways of young generation for socializing and entertaining has been changed and they spend their hours on computers and the Internet for playing games.Therefore, educators has been discussed whether teachers can benefit from gamesand they can combine them with instruction in order to catch students' attention and to enhance learning (Anneta, 2008; Pivec, Dziabenko, & Schinnerl, 2003).

In the literature, it is revealed that there are various purposes of using games as a teaching tool in schools. It is believed that games used for education purposes heighten interest and motivation of learners. They can be utilized for presenting information and principles (Anneta, 2008; Bredemeier & Greenblat, 1981).

Furthermore, Pivec, Dziabenko, & Schinnerl (2010) supported the usage of both computer games and games in general for educational purposes. They stated that games create a virtual environment for students, which offers various situations for their application of what they know and learn from different subject areas. Furthermore, teaching through games encourage students to improve decision-

making skills while they are expected to choose or make a decision at a certain point, and to improve communicative skills while they have opportunity to contact with other team members.

Similarly, Anneta (2008) claimed that educational games facilitate the use of logic, memory, problem-solving skills, critical thinking skills, visualization, and discovery. However, there is a lack of empirical data for effective learning through educational games. There are a few researchers focusing on the effectiveness of educational games on learning process. Hewitt (2010) conducted an experimental study in order to determine effectiveness of using games as a way to change in environmentally response behaviors of students. He concluded that the classroom atmosphere generated by gaming made significant changes in reported environmentally responsible behaviors of both girls and boys. During the learning process, it was revealed that students participate actively in their own learning and they can easily cooperate with each other.

Renaud and Suissa (1989) conducted an experimental study for determining the effectiveness of a simulation game designed to teach children to obey certain traffic safety rules. Results suggested that simulation games including role-playing/group dynamics and modeling/training have positive effect on changes in attitudes and behavior in the area of pedestrian traffic safety in five-year old children.

There are various games aiming at teaching children about risks and disasters. As an example, UNISDR and Playertree developed a free-online game named as "*Stop Disasters!"* that intends to inform students about the risks posed by different natural hazards. By playing it children can learn how to build safer villages and cities and make them more resilient against various disasters through playful means. They also can learn how the location and the construction materials of houses can make a difference when disasters strike and how early warning systems, evacuation plans and education can save lives.

Furthermore, UNISDR and UNICEF have developed an educational kit for children, called as "Let's learn to prevent disasters!". There is a board game "Riskland" in the kit, whose purpose is to provide educated children and community for risk management through an innovative and interactive way. Through this game,

children can learn about what they can do to reduce disaster impacts by answering questions.

2.6.6 Lessons by the guests.

Guests from universities, police station, fire station, government, volunteer organizations, and victimscan be invited to the class to talk about their experiences during and after a disaster. This can help students realize the importance of human lives and disaster preparedness in order to be more resilient to the disaster (Suwa, 2003). Hearing guests' stories also enhances students' motivations for and interests in learning of disaster-related issues.

For instance, aforementioned Maiko High School in Japan has a disaster mitigation course, aiming at raise citizens with disaster mitigation literacy. Within the scope of this course, many guests from different organizations related to disaster mitigation are invited to the schools to deepen students' understandings of environment and disaster mitigation through guests' experiences (Suwa, 2003).

2.6.7 Brainstorming.

As another interactive teaching method for disaster-related issues is brainstorming, which is defined as a creative group-work method.Through brainstorming, learners can create and formulate as many ideas as possible for solving a concrete problem.Ratiani et al. (2011) explained the process of brainstorming and paid attention to the important points that are needed to be careful while doing brainstorming. In the first place, teacher identifies the specific topic that is discussed and students express their ideas. At the beginning of the brainstorming, there is no right and wrong idea. All ideas are accepted without making any judgments or assessments. The important point is to create as many ideas as possible. During brainstorming, teacher writes the ideas down on the blackboard. After that, students are encouraged to make groups of similar ideas and to evaluate them to select several ideas that have the highest rating.Furthermore, teacher hasseveral responsibilities while brainstorming. Teacher should listen to students' ideas about the topic carefully. S/he provides feedback and encourages students to formulate many ideas. S/he also needs to be neutral about the issue in order to prevent frombeing biased.

Although it is emphasized that brainstorming is an effective teaching method for disaster education, there is a lack of empirical data for effectiveness of brainstorming on disaster education in the literature.

2.6.8 Emergency response practices.

As I mentioned before, schools have a responsibility to prepare children for emergencies so that they can keep children as safe as possible in case there is one. Most countries, such as New Zealand, Australia, and Turkey, require schools to have regular emergency response practices that include safety behaviors and building evacuation. They also need to have preparedness plans and evacuation schemes. Studies demonstrate that schools have only focused on the frequency of children's participation in drills. They have shortcomings on specific content and evaluation for improvement of the exercises where appropriate (Finnis et al., 2004; Ronan & Johnston, 2001).

Regular practiced drills, a practical and realistic way of experiential learning, revitalizes teachers and students to shape knowledge and behavior required for disaster risk reduction. Sharpe and Kelman (2011) claimed that practiced drills are more effective for understanding how people react to a variety of risks and how people adopt to disaster risk reduction measures by using multiple intelligences. Students are encouraged to become more confident when they are able to help themselves and others in times of a disaster event through experiential learning and across multiple intelligences.

Johnston et al. (2011) evaluated an earthquake response and evacuation exercise through direct observations in New Zealand and then derived some key lessons on hazard preparedness in New Zealand schools from their results:

- Schools that have well developed and regularly practiced emergency plans gain credibility of students and parents in that they are prepared to protect the safety of the children.
- Before any emergency exercise, all participants need to be fully informed about the required procedures and behaviors.

- To increase the probability that participants will act in an informed and predictable manner in a real emergency situation at school, frequent, and well-learned emergency practices are the key features.
- When children take place in the role playing part of an emergency, they are more willing to engage in the exercise and they have better understanding of possible consequences of a disastrous event, an earthquake in the case of the study.
- When emergency drills are held regularly during school time, when parents are involved and when feedback from the principal reinforces appropriate responses, children pay more attention to emergency drills and they regard them as important for their learning.
- When families take place in the emergency drills, they are more motivated to prepare household.
- Throughout the emergency practice teachers assure children that they are not alone and when needed, and teachers take care of students by keeping contact with them.
- All children need to leave the school with a caregiver during the practices.
- It is important to take all drills seriously and after evacuation, buildings are checked so that all children leave the building and buildings are safe to reenter.
- After each emergency response practice and evacuation drillis held, the next step is to discuss and evaluate processes and behaviors so as to update or revise them where necessary.

Disaster drills at school will become more meaningful if educators provide required basic knowledge that helps students to contextualize them in a sequence of learning events. It is necessary to seek the ways to make the learning process more interesting, less abstract, and more hands-on, in different ways for multiple intelligences but linked to experiential learning. For instance, in the context of disaster-related topics, plate tectonics can be seen as an abstract concept, especially for primary and elementary level students. Sharpe and Kelman (2011) suggested

some practical tips using everyday materials to make this concept more concrete and to help students to understand it in an easy manner.

The link between theoretical knowledge and practical activities should be conducted so that the learning process makes sense to students. In the literature, a cross-country comparative study focused on the impact of disaster education on public preparation and mitigation for earthquakes between Fukui, Japan and the USA.As a result of this study, it was revealed that educational sources should be expanded in different places at different opportunities from theoretical to practices, from written to visual, and from audience to training formats. Hence, the more educational sources one get, the more overall readiness for earthquakes one had (Tanaka, 2005).

Furthermore, there are many educational materials developed through online resources. Fuhrmann et al. (2008) reviewed governmental Web portals including kids' pages that might be useful for assisting instruction on disaster-related education in the United States. Teachers can make adjustment to them within their disaster education context.

2.7 Disaster Education Learning Outcomes

When Selby and Kawaga (2011) reviewed disaster-related education taken place in 30 countries, theyencountered that most of the countries fall short of formulating learning outcomes related to disaster education comprehensively. There is no internationally agreed upon taxonomy for disaster education learning outcomes. Furthermore, they analyzed that disaster education learning outcomes are mainly knowledge-based and give little attention to skills and attitudes. They maintained that there is an urgent need to prepare a comprehensive list of learning outcomes to achieve a well-qualified disaster education, ranging from cognitive to affective to action dimensions of disaster education.Therefore, they produced a generic list of learning outcomes, which can be applied to the entire disaster education field and can be easily made changes to be more specific for different hazard context. The researchers described the process of developing this list as "mapping and gapping

exercise". They examined the existed learning outcomes in the literature and then they determined gaps in current provision of disaster education and how they were filled. The list covers what should be learned implicitly or explicitly in disaster education field. There are three basic categorizes of learning outcomes on disaster education addressed in the list developed by the researchers. These three categorizes and subheadings with an example of a generic outcome for each subheading are given in Table 2.3 (see Appendix B).

This list of learning outcomes of disaster education offers a systematic way to assess what an individual optimally should know and understand, is able to do and develop attitudes towards disaster risk reduction through school education. Selby and Kawaga (2011) suggested that each learning outcome could be rearranged aligned with the development stages of children across different subject areas, which ensures that learners progress towards the full realization of the generic outcome. For instance, after students optimally gain a simple concept at lower age level, more complex idea or concept will be presented more easily at a subsequent age level.

In the case of Turkey, no systematic enumeration or stand-alone listing of disaster-related learning outcomes has been developed. Some learning outcomes specific for disaster-related issues are present in the major subject areas such as social sciences, life sciences, physical education, etc. Although some of them are clearly associated with disaster-related issues, there are some objectives, especially placed in the mathematics curriculum, which do not have direct relation to disaster-related issues. For instance, the objective in the mathematics curriculum at 4^{th} grade goes like this "students will be able to explain the relation between minutes and seconds at the end of the lesson", and students are expected to use data on earthquake durations to practice measurement. In this example, the main focus is not disaster risk reduction. It is a carrier resource for learning of time measurement.

Another drawback regarding to the learning outcomes of disaster education in the program is that some learning outcomes related to disaster risk reduction are repeated at different grade levels; even same objectives are addressed in different subject areas. For example, life sciences at first grade level and social sciences at 4^{th} grade level have the same objective about the needs of people for being

survivedthrough their life. Although lessons and topics were considered as interdependent and the program was developed based upon “binding and blending through and across all grades”, repeating same objective across different grades does not promote learning for disaster risk reduction. Instead of this, learning outcomes should be mutually complementary and they should give students a chance to make progress step by step through all grades.

Finally, an analysis of the learning outcomes regarding to disaster risk reduction reveals several issues. The first issue is that there is no clear linkage between some learning outcomes of major subject areas and the learning outcomes of disaster-related interdisciplinary dimension given in the program. For instance, the study of numbers taken place in the 6th grade mathematics includes comparing and arranging data on the effects of wind and work on probability and statistics uses data on the potential flood hazard.

The second issue is about assessment of students learning on disaster risk reduction. Although different forms of assessment are employed in the program, the most regular one is written tests. As Selby and Kawaga (2012) pointed out, assessment of students’ learning on disaster-related issues is considered as less important element compared to other elements of disaster education. In most cases, assessment part is restricted to knowledge-based through either written or multiple-choice tests. Therefore, because students’ learning on disaster-related skills, behaviors and attitudes cannot be assessed through those tests, they are generally ignored in some way as in Turkish context. For instance, there are several learning outcomes in the program, which cannot be assessed through written tests. In grade 4 social sciences program, there are two interdisciplinary learning outcomes focusing on necessary actions to be taken during an earthquake and aftershocks. Students are expected to practice appropriate safety behaviors in the times of an earthquake drill. However, it is difficult to evaluate students’ performance during a drill.Teacher should be well prepared and prepare a checklist or rubric in order to illuminate the extent of realization of those learning outcomes including necessary skills, behaviors or attitudes while observing students’ performances during drills.

2.8 Summary of the Literature Review

This chapter reviewed the related literature and studies on disaster education programs through schools, and main aspects of disaster education, such as the content of disaster education, effective teaching methods of disaster education, different teaching approaches to disaster education, and major barriers for teaching disaster-related issues. In the light of the literature review, it can be said that disaster education through schools is crucial and getting more crucial to create safer and more resilient culture against disasters.Past experiences have revealed positive effects of school-based disaster education on disaster risk management and vulnerability reduction. Educating children and adults, especially through schools, on safety-related actions, preparedness measures, and encouraging them to communicate with other people around them have contributed to improve better mitigation measures against disasters and build up resiliency of communities. Therefore, it is crystal-clear from the literature that education plays a substantial role in disaster risk reduction and it really works. However, there is an ongoing argument about the quality and the quantity of disaster education to promote these desired impacts on individuals and communities.

Therefore, there are several good practices of integrating disaster risk reduction into educational programs in the schools.It was revealed from the literature that when students are engaged in the learning process actively thorough experiential learning approach, they can acquire required knowledge about and skills on disaster-related issues and can take proper actions in the times of an emergency. Also, educators should take different learning styles into considerationin order to motivate students to involve the learning process.

Furthermore, the need for school-community interaction in order to promote better disaster risk reduction was also emerged from the previous experiences.It is important for disaster risk reduction that each family, each community member, each group in the community, and policy makers should embrace their own roles in the cooperative effort. The school-community interaction can enhance recognizing of each individual’s actions and inactions triggering disasters, thus, it promotes changes

in individual and group behavior.Therefore, everyone should be aware of their responsibilities to be undertaken for effective disaster risk management and reduction, and one of the major goal of school-based disaster education is to raise in awareness not only about physical mechanism of disaster events but also social and economic mechanisms that lead community to be vulnerable to disaster events.

Moreover, to accomplish this main goal, various curricular and extra-curricularactivities on disaster risk reduction and their effectiveness on awareness raising and capacity building also were discussed in this chapter. In the light of the related literature, the common teaching mean for disaster education through schools is evacuation drill. It was understood from the literature review that future hazard preparedness is empowered and community resilience is promoted through evacuation practices at schools. The effectiveness of evacuation practices held in the schools, on the other hand, is open to discuss. There are several deficiencies encountered during the practices. For instance, in most cases, evacuation practices are mandatory for schools and they conduct once a year. Therefore, it may result in students thinking of that disaster can happen one day in a year. Another issue revealed from the past experiences is related to the reality of such events. Some evacuation practices do not reflect the real situation. Hence, students usually do not take them serious and act like in a game. However, evacuation practices are aimed to understand people's actions to different types of disaster events and to provide people a real environment to make practices of safety-related behaviors for them.

Similarly, Turkey has exposed to many devastating natural disasters, such as earthquakes, floods and so on throughout history. Many efforts have been made to recognize the importance of education for better prevention, preparedness, and response in times of an emergency, and to integrate disaster risk reduction in education system recently. Still, it is not expected from the current approach to disaster education in Turkish education system that required knowledge and skills can be transferred to parents as well as students and also, schools are not considered as the main place for implementation of disaster education.

Disaster education in Turkey is implemented through infusing into some major course curricula at primary and elementary grade level, such as social studies, life

sciences, science and technology, etc. However, there is thought to remain several barriers for teaching disaster-related issues existed in the literature, such as lack of teacher trainings, lack of allocated time in formal school curricula, lack of teaching materials, lack of parent involvements, etc.Teachers mostly feel themselves inadequate regarding content and pedagogical knowledge while they teach disaster-related issues. Hence, the need of teacher trainings focusing on both content and pedagogical knowledge and the need of learning materials and activities to guide teachers in the learning process are reflected in the previous research studies. Furthermore, because of overloaded curriculum, especially disaster risk reduction and prevention education has not much time to be allocated in the formal education in the schools. The most common way of disaster education through schools is to integrate disaster-related issues into major courses. The major downside of this integrating approach is related to not sparing enough time for disaster-related issues and related to the fact that teachers have difficulties in making connection these issues with major subject matter. In addition, disaster-related issues are not main foci of the major courses, and although there are limited number of learning activities conducted within the curricula, it was revealed from the literature that disaster education is underestimated and is not paid attention as sufficient as it should be.

2.9 A Reflection on Disaster Education

Although there has been an apparent increase in disaster losses recently, disaster education is relatively young component of disaster risk reduction, particularly in Turkey. Related literature review provides use deeper understanding of what works and what does not work for effective disaster education. Several suggestions for successful disaster education will be discussed in this section based upon literature review and personal experiences.

One of the goals of disaster education is to increase people's motivations about taking safety actions through presenting required information about any kind of a disaster and its risks. To accomplish this goal, it is useful to make people to raise some questions about their safety in the times of a disaster. When people are

informed about the risks posed by a disaster, they are more likely to take protective actions in order to increase their safety. The underlying reason for that can be related to that wondering their safety leads them tosearch formore information about protection ways. At this point, experts, scientist and particularly teachers in this context should offer credible information in order to satisfy their curiosity.

Therefore, there is no doubt about the essential role of formal disaster education in conveying related information about disaster preparedness, response and recovery actions. However, not to lose students' interest in the concept, this information should be provided through various channels, which can make learning more effective and permanent. Thus, we can say that the ways of presenting information is one of the essentials for attracting learners' interests to the topic. While reading or listening can only create knowledge, actual learning is more likely to occur through visualizing, practicing, and discussing. That is to say, it is very helpful for people to imagine potential losses posed by an earthquake through videos, pictures, scenarios, etc., to conduct emergency practices in order to increase the ability to respond properly in the times of an emergency, and last but not least, to discuss related issues with friends, parents, etc. to increase the interaction between each other.

Also, when people believe that they can do about reducing their vulnerability to a disaster, they are more motivated to act in that way. Hence, it is not enough to provide information about those issues for taking proper actions in order to be more prepared. There should be such learning opportunities that students are enable to take active roles in disaster risk reduction, which helps them to develop a "culture of disaster preparedness" (Shaw, et al., 2011). Experience-based learning approach can be effective for this purpose because it fosters better understanding of the disaster-related issues in a way of applying theoretical informationinto real life circumstances. This can result in enhancing individuals to discover their own powers to have control over disasters. When people believe that they benefit from information about disaster-related issues, they are more likely to heed this information and behave in accordance with it in order to increase their safety. In line with this assumption, disaster education should create such learning environments

that enable learners to combine this information with their previous experiences and transfer it to the real world. However, there are various variables that affect people's beliefs, perceptions and attitudes related to hazard preparedness, such as personal experiences, probability of disaster occurrence, etc. It is not easy to change these variables through disaster education, but disaster education can lead people to take the first step of this challenging journey of changing behaviors in a way of delivering related information to people so that they raise their awareness.

Furthermore, disaster education programs should be designed based on geographical conditions of local environment. This enables children to cultivate the relationships between themselves and the environment that they live. Also, they are apt to learn better because they have better understanding of the risks posed by the disaster that is more likely to occur in their region when they focus on the local issues. For instance, an individual who lives in an earthquake-prone region needs to know possible risks of an impeding earthquake to his/her life and properties and how to behave before and in the times of an earthquake to prevent or at least to reduce potential losses. Knowing about local issues contributes to take protective actions. Thus, disaster education is clearly one of the most effective ways for reinforcing the relationships between perceived risks and certain acts.

Moreover, disaster education should begin in the early years of life and continue throughout life. The rationale for this approach is based on three major aspects. The first one is that an individual's personality is shaped in the early years and disaster education in these years can help them to develop life-long behaviors. The secondaspect is that children are more sensitive about what they learn and it is easier to draw their attentions to the topic during these years, which facilates more permanent learning.Also, the third aspect is that adults tend to be more resistant to change behaviors compared to young children. They can be misleaded by their previous experiences and this can cause no particular learning or no behavioral change. Thus, disaster education at the early childhood level becomes critical for children in order to increase their chances of galvanizing the desired behaviors for disaster risk reduction. Otherwise, they could be at risk for never developing such behaviors.

The literature review confirms the golden role of family involvement in disaster education process for children. While children can take only individual safety actions, such as taking drop-cover-hold position during an earthquake,adults have much independence of actions in relation to home-based preparedness, such as making house more resistant to an impeding earthquake. It is important to encourage family members to actively involve in disaster risk reduction through either promoting children-parents communication or organizing family education in order to inform them directly. Therefore, disaster education should make children to share related information with their families. This can provide an opportunity for children to repeat the information at home, and when their parents undertake home-based preparedness actions, they can be role models for their children.

All in all, the success of disaster education programs is related to several elements, as discussed above. The most important one is that disaster education should be a part of culture in daily life with the cooperation of school and family. However, the enduring challenge to disaster education is that it requires continues and progressive process, so that importance on disaster management and risk reduction is not underestimated.

The next part will describe the methodology of the present study, including the design of the study, participants of the study, data collection instruments, data collection procedures, data analysis process, limitations of the study, and determining the quality of the study.

CHAPTER 3

METHOD

This chapter presents the overall design of the study, including description of the case, detail information about disaster profile of Turkey and disaster management strategies, sampling procedure, data collection instruments, validity and reliability of the instruments, data collection procedure, data analysis procedure and limitations of the study.

3.1 Design of the Study

This study was designed as a comparative case study. A case study can be described as “singleness” rather than a procedure.As Merriam (1998) defined characteristics of case study research, a distinctive feature was pointed out particularly, which helps to understand the nature of this kind of research. Sheclarified the case in terms of *bounded system*, which means that the case can be a thing, a phenomenon, or a single unit around which have boundaries.When a study is designed particularly as a case study, it is essential to define *the edge of the case*, which refers to what will not be studying (p.27). According to Merriam (1998), the researcher should limit the number of people who involved in the study and there should be a time limitation for collecting data, which help to restrict the study enough to qualify as a case study. Similarly, Zainal (2007) think of the case study as a holistic, in-depth investigation in a real life context through detailed contextual analysis of a limited number of events or conditions, and their relationships. To regard this, case study research is differentiated from other research designs because researchers are interested in the exploration and comprehensive understanding of complex issues.

There are two basic reasons that the present study was designed particularly as a case study regarding to aforementioned features of case study research.First of all, school-based disaster education project that I am interested in studying was a unique phenomenon, which is differentiated from the current disaster education regarding to several aspects. In this case, pilot schools were introduced various teaching materials for disaster education, which are currently used in Japan and they were expected to enrich teaching process regarding their experiences gained from trainings. In Japan, teachers develop teaching materials. Since teachers have their own experiences, experienced-teaching materials are effectively used for disaster education. Within the scope of the project, in order to take action for preparedness for and prevention against disasters it is emphasized that disaster management should become a part of the culture and get used to it. In Turkey, teachers usually use disaster photographs and videos while teaching disaster-related topics (Öcal, 2005). If the main point is to attract students' interest and awareness, it is necessary to use various teaching materials and methods that are suitable for students' developmental stage. Therefore, this project encouraged teachers to use other teaching materials and techniques to deliver disaster-related issues to students effectively.

Secondly, this present study aimed to obtain information from various sources to examine this specific instance so that we can present and evaluate the impacts of the extra-curricular activities on disaster education on different groups who involved in the project. The case study was particularly suitable design because the focus was to discover the extent to which extra-curricular activities that implemented within the project have impacts in students' knowledge, skills and attitudes, and how it reflects on home-based preparedness through students' perspectives. Furthermore, this present study was conducted as a case study to delineate how teachers and their teaching process regarding to disaster –related issues influenced by the project. To summarize, this case study helped us to understand the processes as well as to discover the outcomes for justification of the case selected.

Before moving to description of the case in detail, a quick review of disaster profile of Turkey will be helpful to understand what experience, and what have done to promote loss reduction until today.

3.2 Disaster Profile of Turkey

Turkey is a country at risk from many kinds of natural hazards. Throughout history, in Turkey, natural hazards have caused loss of lives and property in a large manner and people who experienced these hazards did not have sufficient capacity to response to and recover from their negative impacts. They had difficulties in going back to normal life. According to data provided by General Directorate of Natural Disasters (GDND), natural disasters that occurred in Turkey have resulted in 87,000 people killed, 210,000 people injured, and 651,000 houses collapsed since the beginning of the 20th Century.

Earthquakes are the major disaster events at 97 % and caused the greatest amount of economic and infrastructural damages from 1980 to 2008, followed by landslides and floods. It is estimated that the devastating 17 August and 12 November 1999 earthquakes caused a decrease in 6.1 % ratio of Grass National Product (GSP) (GDND, 2004). According to reports from United Nations International Disaster Risk Reduction, the 1999 Istanbul earthquake, the deadliest disaster among 10 disasters occurred in Turkey from 1980 to 2010, resulted in 17,127 people killed and 20 million US dollars damage (UN/ISDR, 2012).

Following major disaster event in Turkey is flood at 30 %. The Mediterranean area has the greatest number of floods and wildfires lately due to unplanned urbanization, environmental degradation from new infrastructure developments, and industry (UNICEF & UN/ISDR, 2011). Furthermore, the Black sea area is a highly landslide-prone region of the country where Trabzon, Kastamonu and Zonguldak are provinces at high risk of landslide hazards (GDND, 2004).

3.2.1 Disaster risk reduction strategy in Turkey.

Turkey is also well aware of the importance of risk reduction strategies in line with the rise of global interest in the concept of disaster risk reduction. For instance, Turkey has adopted the Hyogo Framework Actions as a key guidance text for national progress in disaster risk reduction (UNICEF & UN/ISDR, 2011).

General strategies.

In Turkey, to coordinate all activities during emergencies, the Prime Ministry Management Centre was established in 1997, which has the Crisis Coordination Council conceived as the main operational development for prevention, mitigation, and direct intervention during emergencies. In addition, The Prime Ministry Disaster and Emergency Management Presidency (AFAD), established in 2009, provides the coordination between governmental, non-governmental, and private organizations to take necessary actions for effective emergency management. There are three incidents programs conducted by AFAD, which are pre-incident for preparedness, mitigation and risk management; mid-incident for response; and post-incident for recovery and reconstruction.

The devastating earthquake in 1999 in Turkey led to disaster management being placed on the Government's agenda. Göktürk and Yılmaz (2001) categorized the disaster management policies carried out in Turkey throughout history into three time periods. Before 1944, the disaster management system in Turkey was mostly focused on post-disaster activities and there was no legislation or initiative to risk reduction and prevention approaches. From 1944 to 1958, due to experiences with catastrophic earthquakes that occurred during that time, pre- and post- measures were legislated and regulations about what to do in disaster-prone territories in Turkey were developed. After 1958, the disaster management policies were changed in the line with international disaster management standards. Responsibilities of governmental and non-governmental institutions were specified in terms of pre-, mid-, and post- disaster terms. The 1999 devastating earthquake has become a breaking point for disaster risk reduction measures. There were important laws and regulations developed for prevention or at least lessen the negative impacts of possible disasters people might experience. After the 1999 Istanbul earthquake, the Turkey Emergency Management General Directorate (TEMAD) was established with the support of the World Bank to coordinate the actions among different actors at the local, national, and international level pre- and post-disasters (UNICEF & UN/ISDR, 2011).

Furthermore, Turkey has taken many recent initiatives and developed strategies

for disaster risk reduction and management. A National Platform for disaster risk reduction was established, adopted by the first priority of the HFA with the coordination of UN/ISDR in August 2011 (UNICEF & UN/ISDR, 2011). Moreover, AFAD developed the National Disaster Management Strategy and Action Plan, including short-term and long-term disaster risk reduction objectives in line with the HFA by the end of 2011. Governmental institutions, non-governmental organizations, academicians from universities, experts in disaster risk management and reduction related issues participated in developing the plan.

In contrast to these important healing efforts for the disaster management system in Turkey, social awareness about disaster and protection ways for disaster-related issues are still insufficient. As a matter of fact, disaster education policies that empower the disaster management system, and disaster education implementation in line with these policies have come into prominence lately.

Disaster community education to promote safety in Turkey.

As an essential component of disaster risk reduction, disaster education, including trainings and activities, effective in raising awareness, has been given weight by AFAD. Decision makers, national and local officials, non-governmental organizations, and community members are participants of these disaster education activities. Informative texts and visual materials on disasters and emergencies are published and distributed in order to raise public awareness and to help protect themselves against damages caused by a disaster event.

Furthermore, there are research centers in the field of disaster management within Middle East Technical University and Istanbul Technical University serving training, consultation, and research activities. Training topics include first aid, activities for increase in structural and non-structural risk awareness, and revision of the public buildings especially school buildings. It should be highlighted that these efforts are not considered at the national level and they are mostly limited to particular regions in Turkey. For instance, a project on disaster preparedness education (AHEP) has been carried out by Bosphorus University Kandilli Observatory and Earthquake Research Institute (KRDAE) in order to reach community members through four training programs as follows: (i) Basic Disaster

Awareness (ABCD), (ii) Mitigation of Non-Structural Hazards (YOTA), (iii) Structural Awareness Towards Earthquakes (DKYB), and (iv) Civil Defenders-Community Disaster Volunteers and Community Disaster Preparedness Education Program (SSG-TAG). The Ministry of National Education (MoNE), the Ministry of Interior Civil Defense General Directorate (MoICDGD) and the Turkish Red Crescent / American Red Cross have cooperated within this project. In 2004, KRDAE established the Disaster Preparedness Agency (AHEB) in order to maintain these training programs. Within the scope of this project, educational materials, such as disaster preparedness handbooks, CDs, and flashcards are prepared. In addition to theoretical information, the "Deprem Park" simulation center has organized to provide practiced activities on disaster preparedness. According to the report, in 2011, 122 schools, 4087 students, and 227 teachers were informed about pre-, mid- and post- earthquake measures through "Deprem Park" trainings.

Moreover, JICA also has organized a training program including educational activities, publications, such as, a basic principles of disaster management book, visual materials such as, CDs and DVDs, and video conferences with different organizations in the field of disaster management and an online dialogue for transmitting from Japanese experiences on disaster risk reduction to Turkish participants. The participants are governmental officers, technical staff, and emergency managers.

The next section gives detail information about the case in order to illustrate what characteristics make it unique and specific, particularly in the national scale.

3.3 Description of the Case

3.3.1 Background of the project.

The importance of formal and informal school education about disaster and emergencyhas been stressed in the recent times. Integration of disaster and emergency subjects into some major curricula in primary and secondary education and trainings of teachers on protection from disaster and emergency were highly recommended in the National Earthquake Strategy and Action Plan 2012-2023

(Action C.1.2.4.& Action C.1.2.5.) However, the Government of Turkey have not made any efforts for implementation of disaster education at schools recently focused on the implementation of disaster education through schools.

Within this scope, MoNE requested from Japan in September 2008 to help them to improve curriculum, training implementation and disaster prevention systems of schools in Turkey based on their experiences for the purpose of improving both the relief capacity and the overall disaster management capacity.

During the period from July 2009 through May 2010,JICA assigned the Detailed Planning Survey Team to define the contents and scope of the cooperation of the project in line of the agreement with Turkey. As a result, the both sides signed on the Minutes of Meeting (M/M) and Record of Discussions (R/D) on October 18, 2010. The project was implemented in accordance with M/M and R/D.

The project included 80 primary and elementary schools from 10 provinces which are Balıkesir, Bolu, Bursa, Çanakkale, Düzce, İstanbul, Kocaeli, Sakarya, Tekirdağ and Yalova. There were three terms of the project starting from December, 2010 to December, 2013.

The project implementation agency was comprised of the Department of In-Service Training of Ministry of National Education. The major role of the project implementation agency was to take full responsibility for the management of the project implementation.

3.3.2 Basic principles of the project implementation.

The main purpose of the project was to enhance disaster awareness of teachers and school administrators, improvement of disaster education system, and improvement of risk management in primary and elementary schools in provinces of Marmara region, Bolu and Duzce.The project was implemented based upon basic principles, namely securing of continuity and self-expansion, securing of flexibility of the project, valuing of capacity development and implementation of capacity assessment, revision of the course textbooks, and preparation of schools' emergency disaster management plan.

Securing continuity and self-expansion.

The continuity of the related activities and self-expansion were found important in order to achieve more effective disaster education. In each province, master teachers were selected by MoNE for trainings at training centers of MoNE or Provincial Education Offices. Furthermore, master teachers, who received trainings provided within the scope of the project were encouraged to disseminate knowledge and guidance activities to their colleagues.

EachProvincial Education Office was responsible for implementation of the dissemination of contents of disaster education that were guided by MoNE to each school in the province.It was expected that Provincial Education Offices develop a standardized guidance of disaster education for every school with the cooperation of master teachers and school administrators. The Provincial Education Offices were expected to use the schools' disaster prevention handbook and emergency management plan guidebook for standardizing disaster education implementation.

In the first master teacher training, civil defense specialists who were selected from each province to attend the training were assigned to prepare a dissemination plan of disaster education trainings and they presented the prepared plans to MoNE by the second master teacher training time. Moreover, master teachers played role in conducting training activities in their belonging provinces. Table 3.1 demonstrates master teacher trainings held in Turkey with their contents and by whom teachers were trained.

Table 3.1 *List of Training Contents and Lecturers in Turkey*

Training Session	**Content**	**Trainer**
The First Master Teacher Training (October 2011) for 7 Days	Basic Information on Disaster Events, Psychological Support, Natural Disasters Insurance Authority (DASK), Disaster Education in Japan	Academicians, AFAD, Hyogo Prefecture Education Board
The Second Master Teacher Training (January 2012) for 3 Days	Methods and Techniques of the School Disaster and Emergency Management Plan Preparation, Regulations for Natural Disasters, Comparison of teaching disaster-related issues between Turkey and Japan	Academicians, AFAD, Hyogo Prefecture Education Board
Demonstration Mode Class (February 2012) for 4 Days	Model Class Practice and workshop of teaching plan of the model and demonstration class	Academicians, Hyogo Prefecture Education Board
The Third Master Teacher Training /Competition (September 2012) for 4 Days	Teaching Methods of Disaster Education, explanation of guideline of the school emergency and disaster management plan, Presentations on Learning Activities of Pilot	Academicians, National Education Strategies Research Center (Japan)

The Study Team proposed a disaster prevention plan contest in order to promote disaster education in Turkey. At the end of the contest, top ten good teachers were selected to visit in Japan for a chance to recognize activities and plans related to disaster education in Japan. Table 3.2 displays master teacher trainings held in Japan with their goals, outcomes and participants.

Table 3.2 *List of Training Goals, Outcomes and Participants in Japan*

Training Session	**Goals**	**Participants**	**Outcomes**
The First Training in Japan (March 2011）	The Comparison of Disaster Education Taken Place in Japan and Turkey	7 Officers from MoNE and 3 Academicians	Comparison of Disaster Education Programs, Revisions of Learning Objectives, Designing of Handbooks
High-ranking officers in the First Training (November 2012）	The Comparison of Disaster Politics of Turkey and Japan	The Undersecretary of Mone, The Heads of General Directorate of In-Service Training, General Directorates of Primary and Secondary Education, The Board of Education	Establishing of Disaster Management Unit in the Central Organization, and Sustainable Disaster Education Unit in Provincial Organization (May 2013)
The Second Training in Japan (January 2013）	Disaster Education Implementation Examples, Teaching Methods and Developing An Attitude Toward Disaster Preparedness	1 Head of Group from Mone, 14 Master Teachers from Each Pilot Province Except Çanakkale	Developing Concrete Attitude Toward Disaster-Related Issues, Raise in Attitude of Headmen Toward Dissemination of Disaster Education

Securing flexibility of the project.

Contents of activities related to the project was identified by Project Implementation Agencies (PIA) and local and Japanese consultants. Contents of activities were flexibly revised regarding to the capabilities of the PIA. In that case, the consultants had responsibility to examine the overall progress of the project and if necessary, they could propose the revision of the direction of the project to JICA. The necessity of coordination with Turkish side and JICA were revealed because both side had different perspectives to implementation method and contents of activities. For that reason, the Study Team flexibly adjusted the contents of activity with the help of Japanese consultants as well as local consultants.

Capacity development and implementation of capacity assessment.

In order to examine the capabilities of training participants, after taking the first training, training evaluation method was utilized. According to the feedback from the evaluation, contents were revised depending upon the circumstances. As a training evaluation method, the satisfaction survey, pre-post- test and participation evaluation were used during the project time. Furthermore, the baseline surveys were developed and conducted to analyze basic information about school administrators, teachers, students and parents at pilot schools and control schools in the project.

Evaluation of textbooks.

The course textbooks were evaluatedand several printed materials weredevelopedso that teachers could integrate those materials into their teaching.

Preparation of schools' emergency disaster management plan.

The Disaster and Emergency Management Directorate in Turkey (AFAD) promoted a new disaster prevention plan as a guideline of school emergency and disaster management plan under the cooperation with Provincial Education Offices. The Training Development Group (TDG) prepared this guideline by January 2012 and then, master teachers were informed about that guideline at the master teacher training. They were expected to prepare a disaster prevention plan for their schools. TDG gave advice and assisted to each pilot school for plan making. Various Japanese and other foreign cases were introduced to each pilot school through trainings. Since each school developed their own plan, it can be thought that disaster prevention plans of each pilot school are unique and independent from each other. Favorable cases were reflected into the guidelines and disaster education handbooks.

3.3 Participants

Merriam (1998) claimed that two levels of sampling are usually utilized in the case studies. After selecting "the case" to be studied, it is necessary to do some sampling within the case unless it is intended to study with all people within the case. The researcher did not plan to collect data through all people participated in the school-based disaster education project. A criterion established for selection the

sample within the case was that being successful in addressing disaster education. Within the scope of the project, several disaster education contests were hold to determine successful schools. In one of the contest, project schools were expected to prepare a contest portfolio including a school emergency and management plan, a school poster related to disaster prevention and preparedness, activities and materials developed for disaster education and dissemination activities of disaster education to the nationwide. As a result of this contest announced on October in 2012, one winner school was selected purposively and called as School A. In the school, the number of students from 5th grade to 8th grade was 382 and the number of teachers was 16.Among them, 251 students and 6 teachers participated in this study. In addition, researcher interviewed 3 students from 7th grade and 8th grade levels.

Table 3.3 shows the distribution of students according to grade, and gender. The age of the participants from School A was between 10 and 16 (*n*=251). There were two dominant age groups among them. 30.7% (*n*=77) of the students were at the age of 12, and 25.1% (*n*=63) of the students were at the age of 11.

Table 3.3 *Students' Distribution of School A According to Grade and Gender (N=251)*

Grade	**Gender**	***f***	**%**
	Female	25	46.3
5	Male	29	53.7
	Total	54	100.0
	Female	34	45.3
6.	Male	41	54.7
	Total	75	100.0
	Female	32	47.8
7.	Male	35	52.2
	Total	67	100.0
	Female	34	61.8
8.	Male	21	38.2
	Total	55	100.0

Each project school had its own control group school with the purpose of making judgment about effectiveness of disaster education activities. Hence, School B as the control group of SchoolA was selected automatically. In the school, the number of students (6^{th} grade- 8^{th} grade) is 102. 32 of them were 6^{th} graders, 33 of them were 7^{th} graders and 37 of them were 8^{th} graders. Among them, 95 students were involved in this study.Table 3.4showsthe distribution of students from SchoolB according to grade, and gender.

The age range of the participants from School B was between 11 and 15 (*n*=95). There were three dominant age groups among them. 59.0% (*n*=56) of the students were at the age of 13 and 14, and 28.4% (*n*=27) of the students were at the age of 12. Table 3.4 presents the distribution of students from School B according to grade, and gender.

Table 3.4 *Students' Distribution of School BAccording to Grade and Gender (N=95)*

Grade	**Gender**	***f***	**%**
	Female	18	60.0
6.	Male	12	40.0
	Total	30	100.0
	Female	18	60.0
7.	Male	12	40.0
	Total	30	100.0
	Female	23	65.7
8.	Male	12	34.3
	Total	35	100.0

As students from School A are examined, it was revealed that 5.8% of the participants (*n*=14) were involved in the club of Environmental Protection, 3.7% of them (*n*=9) were from the club of Civil Defense, 4.9% of them (*n*=12) were from the club of Traffic and First-Aid, 6.6 % of them (*n*=16) were from the club of Social Assistance and Solidarity, and 5.8 % of them (*n*=14) were involved in the club of Red-Crescent. The remaining 74.2 % were from various types of school clubs. When the type of their school club for each school is concerned, it is seen that 17.0% of the

participants from School B (*n*= 16) were involved in the club of Environmental Protection, 7.4% of them (*n*=7) were involved in the club of Civil Defense, and 8.5% of them (n=8) were involved in the club of Social Assistance and Solidarity. The remaining 66.0% were from various types of school clubs.

There were 6 teachers worked as different subject experts in School A, which were shown in Table 3.5 below. Their teaching experiences were ranged from 7 to 18 years. Almost all participants were involved in disaster drills at the school and except one teacher worked as psychological counseling and guidance, they have not had any in-service training on disaster education. All participants did not work as a volunteer in any organizations for disaster risk management and half of them experienced an earthquake and the other half did not.

Table 3.5 *Descriptive Statistics of Teachers*

Subject area	**Teaching experiences (years)**	**In-service training on disaster education**	**Disaster experiences**
School Counselor	7	Yes	Small scale Earthquake
Science	5	No	Small scale earthquake
Classroom	18	No	No
English	7	No	99’ Istanbul earthquake
Social Sciences	8	No	No
Physical Education	17	No	No

3.4 Data Collection Instruments

Unlike other types of research such as experimental, survey, etc., there is no absolute procedure or particular method associated with the case study. It allows whatever procedures and methods to be used (Merriam, 1998). Data collection instruments of this study were a student questionnaire, semi-structured interviews with teachers and students, observations and document analysis.

3.4.1 Questionnaire.

The student questionnaire developed by the researcher aimed to explore four main dimensions; students' hazard awareness and risk perceptions, disaster preparedness, home- and school-based disaster communication and disaster education process through schools. During the development of the student questionnaire, the researcher followed several steps as explained below.

Firstly, related studies, books, theses, and articles werereviewed through databases such as Eric, Ebscohost, and Scholar Google. During this research, some instruments were found and they were related to dimensions of this study (Finnis et al., 2010; Johnston et al., 2006; Ronan & Johnston, 2001). However, they were designed to assess some additional dimensions, such as psychological issues on hazards and emergencies, which are out of the scope of this study. Furthermore, all items on those instruments were designed as multiple response items, which is another main difference from the questionnaire of this study. Some items on this questionnaire of this study were written as open-ended form under the related dimensions since the aim of this study was to obtain in-depth information about the situation and the researcher did not want to restrict students' answers of these items.In the light of existing literature and related instruments, the researcher prepared the first draft of the questionnaire.

After examining the items with the help of the supervisor, some items were changed. For instance, some items on the first draft of the questionnaire were designed as "yes" or "no" format. With the help of the supervisor, "no, but intend to" option were added. In addition, two open-ended items for obtaining students' views on the necessity of and self-impacts of disaster education through schools were

added according to the feedback from the supervisor. In order to control face and content validity of the questionnaire,six experts expressed their opinions about its face and content appropriateness. Four of these experts were teachers working at the project schools, and two of them were from the department of Educational Sciences. They were given the questionnaire and asked to evaluate the physical appearance, clarity of the items, their relevance to the content and purpose of the study, and its appropriateness of students' understanding level. Then, necessary changes were done before piloting it.

In the end, the questionnaire (see Appendix D) consisted of two parts. The first part was the demographic information part, which included items asking for school name, gender, age, grade and the student club that they belong to. The second part of the questionnaire was composed of a series of questions that coveredsix main themes:

Risk perceptions and hazard awareness.

Students were asked a number of questions to assess their risk perceptions and hazard awareness concerning hazards that they are likely to experience: (a) definition of "disaster" concept in their own words; (b) the most likely hazards to affect them in the region that they live; (c) self-impacts of hazards that are likely to occur in the region that they live; (d) impacts of hazards that are likely to occur in the region that they live on their family, their school, their community and environment that they live; (e) awareness of own responsibility for protection against negative impacts of hazards; (f) self-sufficiency about disaster preparedness measures,

Preparedness (factual knowledge).

Students were asked to clarify (a) possible preparedness measures for hazards that may occur in the environment that they live, (b) appropriate protective responses during and after the event of exposure to specific hazards.

Preparedness (performance-based).

This part consisted of Likert-scales ranging from "yes" to "no". Also, "no, but intend to" was added so as to distinguish between participants who have not done yet but are intend to do so and participants who have not done anything to be prepared for a hazard in the future. Having family emergency plan and map of the house

showing exits, utility switches, etc., making practice about what to do in the event of an emergency, stored emergency equipment such as flashlight, battery powered radio, spare batteries, etc., are some of the items regarding actual emergency preparedness performance.

Communication about disaster-related issues.

Students were asked whether they talk about any of the specific hazards with parents or friends. This part also consisted of "yes", "no, but intend to", and "no" scales.

Disaster education program in the schools.

Students were asked about implementation of disaster education in their school and its impacts on themselves. This part was consisted of five questions. The first one was divided into two sections, disaster education through curricular activities and disaster education through extra-curricular activities. This item had three scales that addressed the sufficiency level of disaster education activities. These scales were ranged from "disaster education takes place at sufficient level", "there are some activities on disaster-related issues but they are not sufficient", and "there is nothing about disaster education in the school"

In addition, there werethree open-ended items in this part. The first one wasdealing with the way that disaster education program is implemented through curricular and extra-curricular activities.The second item focused on how disaster education programs in the school contributed to students. The last one was serving the aim of students' views on the necessity of disaster education.

Resources for getting information about disaster-related issues.

Students were asked to endorse the items that they preferred resources apart from the school to get information about disaster-related issues. This part was divided into six sections, family members, friends, books, Internet, TV and newspapers, and an empty section for their additional resources. This part was also consisted of three scales, "yes", "no, but intend to", and "no".

3.4.2 Semi-structured interviews.

Interviewing was the best technique to use for exploring participants' perceptions about disaster education and impacts of school-based disaster education

project on themselves. In this case, interview is essential because we could not observe the implementation process and interviewing is necessary to find out participants' interpretations and feelings about this particular phenomenon. According to Merriam (1998), the using of interview method for primary data collection is related to two things, which are the kind of information that is needed and the preferable way to get these data. In some cases, researcher think that interviewing is the best way to get the data that s/he need because when s/he makes interview, s/he get better data, or more data or data at least cost or it is only way to get data. In this study, researcher conducted interviews with teachers to obtain information and opinion about school-based disaster education process and to reveal the positive and negative sides or shortcomings of the project (See Appendix E). In addition, researcher also collected data through interviews from students in order to triangulate data gathered from the student questionnaire and obtain more information about the process (See Appendix F).

For this study, semi-structured interview approach was used to access participants' perspectives and understandings of the case. Merriam (1998) suggested that multiple questions, leading questions and yes-no questions should be avoided in an interview. Hence, the questions to be asked were developed considering this recommendation. Most of the questions involved in the interview were open-ended and mostly flexibly worded. Some questions were followed up with probes to specify the questions or to clarify what respondent was on to, or to exemplify them (Merriam, 1998). However, there were some highly structured questions in order to get specific demographic information, which are teaching experiences (years), teaching majors, participation in disaster drills, in-service training regarding to disaster education, being volunteer in some organization for disaster risk management, and disaster experiences, from all respondents. The remaining part of the interview was guided by a list of questions determined ahead of time. There were two main parts of the interview that it was shaped around. The first one was regarding to disaster education taken place in the school before and after the project. The questions corresponding to this part involve several questions about curricular and extra-curricular activities conducted in the school, impacts of those activities on

teachers, students and parents, assessment ways of students' learning about disaster-related issues, and problems that they encountered during the process and possible solutions for them. The second part of the question contained several issues to be explored, such as the necessity of disaster education, opinions and suggestions on the ideal disaster education to be implemented in the schools, parent involvement in the process and the impacts of disaster education through schools on parents.

Researcher also conducted interviews with three students to obtain more specific information and to triangulate the data gathered through questionnaire. Students were asked to give more detailed information about their understandings from the concept of disaster, and protection ways against them, implementation of disaster education process, their perceptions toward disaster education, and the impacts of disaster education on parents and home preparedness.

The interview questions were reviewed by two experts in order to prevent a bias that researcher can make and to find out which questions were needed to reword, and which one was out of the focus of the study or which one misdirected the respondents. According to Merriam (1998), piloting interviews is crucial for trying out questions' clarity. Therefore, the tool was piloted with 2 teachers and 2 students to get some practice and to make certain that what is being asked is clear to the participants.Researcher recorded all interviews and the time was ranged from 11 minutes to 26 minutes.

3.4.3 Observations.

Merriam (1998) pointed out the importance of making observations and when it combined with interviewing and document analysis, it allows for a holistic interpretation of the case being investigated. Hence, observations were conducted in order to triangulate emerging findings gathered from interviews and questionnaire, to provide specific knowledge of the case, the physical setting, and activities, and to document what has done in the school within the scope of the project. Researcher took field notes and took some photos to record data during the observations. According to Merriam (1998), it becomes easier to analyze data when observations are recorded through either field notes or mechanical devices such as videotapes, tape recorders and film. Therefore, researcher developed an outline to record

observation in a systematic way as soon as possible and took some photos to document the setting. The outline has two main categories, which are school-based preparedness measures, and class-based preparedness measures (Appendix G).

3.4.4 Document analysis.

Researcher accessed some documents that help to investigate more specific knowledge about what was going on in the school regarding to school-based disaster education. The teachers who involved in the project prepared a portfolio that contains lesson plans, learning activities on disaster-related issues (danger hunt, pictogram, discussion, acrostic completion, rap completion, poster completion, etc.) that they developed, dissemination activities, school disaster and emergency management plan, and evacuation drills. Researcher used these documentary materials as data for discovering insights relevant to the study and triangulating other data gathered from interviews and questionnaire and to develop a holistic perspective about school-based disaster education.

Thefinal versions of the data collection instruments were submitted to Human Subjects Ethics Committee in METU to be examined for ethical concerns. According to the committee, the questionnaire, interview questions and observation forms did not involve any ethical violation and could be conducted.

3.5. Piloting the Data Collection Instruments

After approval of the ethical committee, data collection instruments were piloted in one of the project schools in Kocaeli. Then, as a result of the analyzing data obtained from the piloting study, it was revealed that learning activities taken place in the project schools were mostly associated with earthquake preparedness since the region is prone to earthquakes. Both students and teachers in the school highly focused on earthquake-related issues. Therefore, some questions were specified for earthquake-related issues in order to find out their perceptions about earthquake concept, and what types of preparedness measures were taken in order to be more protected both in the school and their houses.

3.6 Data Collection Procedures

Table 3.6 displays the time line of data collection process for the present study. As seen in the table, after piloting data collection instruments, researcher visited School A to distribute the questionnaire to students and in the meantime, researcher made interviews with 6 teachers on the 17th of October 2012. After collecting questionnaire, researcher also made interviews with 3 students in the break time. Researcher also requested to access their project portfolio including learning activities that they implemented, evacuation drill plans, and school emergency and disaster management plan. This portfolio stimulated what they did within the scope of the project and provided concrete evidences of relations and happenings in this particular setting, and especially evidences of filling the holes of description of the case. Before leaving the school, researcher made some observations and took some pictures of structural mitigation and preparedness measures that they took. Fixed bookcases, emergency exit signs, pictogram on the walls of canteen, school bulletin board, posters regarding to disaster education that students created, and emergency kits for each class were some examples. On the following day, the researcher visited the School B to collect data from students for making comparison of students' learning from current status of disaster education and school-based disaster education. Researcher did not make interview with teachers from the control group school. Instead of this, researcher made document analysis of course textbooks and objectives regarding to disaster education in order to examine the place of disaster education in the Turkish education system. Actually, because Turkish Education system is highly centralized and is based on top-down approach, all teachers have to deliver what curricula say as they intend to. Therefore, teachers from School A were asked to inform us about how they teach disaster-related issues before the project and to give enough detailed information to understand the current status of disaster education.

Table 3.6 *Time Line of Data Collection Process*

	Data Collection Instruments	**September (Piloting instruments)**	**October**
School A	**Observations and Field notes**	*****	**One-shot**
	Interviews with students and teachers	*****	**One-shot**
	Questionnaire	*****	**One-shot**
School B	**Questionnaire**	*****	**One-shot**

3.7 Data Analysis

The data collected through open-ended questionnaire,interviews with teachers, field notes and documents, were analyzed through content analysis, which is a process of examining content and themes in written document (Hays & Singh, 2011). The main purpose of content analysis is to simplify the complexity of data into meaningful categories or themes (Patton, 1987).According to Patton (1987), organizing the data into particular category or theme is like labeling and establishing a data index, which is considered as the first step of the content analysis. Therefore, themes and categories of analysis were emerged out the data in inductive content analysis (Patton, 1987). Researcher began by reading the raw data, looked for "recurring regularities" in the data (Patton, 1987, p.154), specified the categories and themes according to these regularities, and then sorted raw data into specified categories.Main categories emerged from interviews with teachers are appeared as shown in the Figure3.1 below.

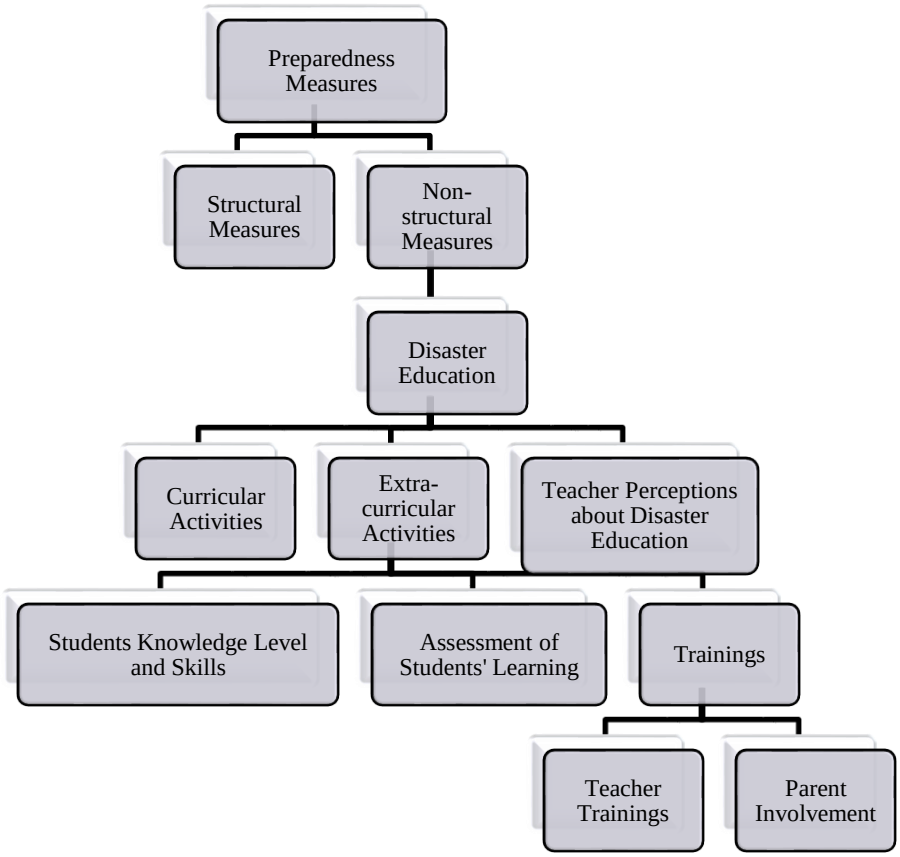

Figure 3.1. Main Categories Emerged from Interviews with Teachers

Data collected through open-ended questionnaire from students were also classified into seven main categories as followed; students' understandings from disaster concept, their risk perceptions toward disaster events, preparedness measures against disaster events, such as earthquake, flood, fire, landslide and avalanche, disaster education activities in the school, responsive and recovery measures for an earthquake, impacts of disaster education on themselves, and the necessity of disaster education.After conducting pilot study for questionnaire, the data were analyzed and Table 3.7 presents the initial coding themes emerged from the questionnaire data in the pilot study.

Table 3.7 *Initial Coding Themes of Data EmergedfFrom Questionnaire in the Pilot Study*

Main Categorizes	**Initial Coding Themes**
The definition of "disaster" concept	Potential hazard impact Occurrence mechanism of disasters
Risk perception	Self-risk perception Risk of family members Risk of school Risk of environment
Preparedness measures against disasters (earthquake, flood, fire, avalanche and landslide)	Structural mitigation measures Non-structural mitigation measures
Disaster education activities	Disaster response training Disaster mitigation measures
Disaster education impacts	Positive impact No impact
What to do during and after disasters (earthquake, flood, fire, avalanche and landslide)	If indoor If outdoor
Necessity of disaster education	Necessary Not necessary

Field notes collected through observations and documents were analyzed regarding to main categories being decided prior to data collection and analysis process as described in detail in the part of data collection instrument.

3.8 Limitations of the Study

This case study offers a rich picture within the boundaries coming from many kinds of information and from different angles about disaster education. Since we tried to analyze disaster education from specific examples, it seemed we cannot generalize what we found from the study and this can be considered as a limitation of this study. However, as mentioned before, in this study to strengthen generalizability of the study, researcher used some strategies, such as thick description, etc.

On the other hand, the strong limitation of the study was related to narrowing of the scope of the disaster education down to earthquake preparedness education. The schools selected placed in Marmara region, which is one of the earthquake-prone regions in Turkey. Therefore, disaster education more focused on earthquake preparedness and prevention education in these schools. However, this does not mean that the other issues in disaster education did not illuminate in these schools.

Another issue was related to data collection time. Although the project was held for three years and researcher collected data in the second year of the project, as understood from the data collected though questionnaire and interviews, participants had difficulties to remember what they did in the previous year, which was the most intense year of the project because their interest of the case was alive at most. The other reason for that researcher collected data from all stakeholders of the project and through several methods was to fill the missing and uncovered points of the case so that a holistic perspective could be revealed.

Also, home-based preparedness to have been adopted was based on what students reported in the questionnaire in the present study. Therefore, this can be a limitation of this study.

3.9 Trustworthiness and Dependability

A case study as a qualitative study is considered more subjective than quantitative studies since researchers generally have direct personal contact with people examined. Therefore, researchers need to avoid subjective judgments during research design and process in order to enhance the quality of the study. Constructing evidences for validity and reliability maximize the quality of the case study (Riege, 2003). Since the purpose of a qualitative study and a quantitative study is different from each other, the way judging the quality of the study is different in each research pattern. Therefore, qualitative researchers view the concepts of reliability and validity differently. Our expectations about reliability in a case study has less meaningful since there is one case and we cannot make any assumption that if the case were repeated by different people at different time, the results would be similar

(Thomas, 2011). In other words, these terms as defined in quantitative terms may not be applied in qualitative research studies. On the other hand, the idea of dependability corresponding to reliability in qualitative perspective emphasizes the need for indications of stability and consistency in the process of the research. The underlying issue here is that whether procedures and techniques used in the study are consistent. There are some ways of increasing dependability. In this study, researcher carefully reported how data were collected, how categories were derived and how decisions were made throughout the research in order to provide evidences regarding the research process for other researcher to review (Hays & Singh, 2011; Merriam, 1998).

In addition, another technique to ensure that results are dependable is triangulation. Researcher triangulated the data through using multiple instruments from multiple sources (Hays & Singh, 2011; Merriam, 1998). Within the scope of the study, students were asked to answer the questions of the questionnaire and three of students and teachers were interviewed, and researcher made some observations in the school and took some pictures to document what was happening in relation to disaster education. The underlying reason of collecting data from various data sources through various means was to confirm the emerging findings and to obtain further information about the case.

Furthermore, likewise in the quantitative study, in a case study, there are some underlying types of validity. There is an analogous to enhance the internal validity named as credibility. Merriam (1998) described the credibility as "the question of how research findings match reality" (p. 201). In the literature, there are several strategies to enhance credibility of the study. In this case, researcher also used triangulation technique through multiple sources of data and multiple methods to collect data to enhance credibility of the study. Two peers interpreted findings of the study in multiple ways in order to maximize credibility of the study.

Another issue is transferability as an external validity in the qualitative studies, which is related with generalization of the study findings. It emphasizes whether researchers show similar or different findings of the study among similar or different participants or not (Riege, 2003). Since this is a comparative case study, comparison

of the evidences between two schools and with the literature within the boundaries defined for this study enabled the researcher to achieve reasonable generalizations. In order to enhance transferability of the study, researcher wrote out detailed descriptions of all processes including selection of participants of the study, data collection procedures, and analyzing and interpreting data. This enables audiences to determine if findings can be transferred to other contexts (Merriam, 1998).

Another way of establishing transferability that researcher used was that using of multiple data sources through multiple means. Researcher collected various data from both teachers and students. Also, researcher made observations and documented what was done in the school for effective disaster education and the documents that participants prepared within the scope of the project were analyzed. While doing this, researcher used multiple data collection instruments. For instance, students were asked to fill the questionnaire and some students were interviewed in order to obtain more detailed information. This was helpful to achieve parallelism among them (Merriam, 1998).

3.10 A Reflection on the Researcher's Role

While carrying out qualitative research, it can be tricky, sometimes impossible to remain outside of the process, including which data are collected, organized, and interpreted. This was certainly the case in my study. I feel that I involve myself in every aspect of the work. Lichtman (2006) explained the critical role of researcher in a qualitative research study and underlined the importance of being aware of researcher's effects on the process and effects on herself with this expression "…the researcher shapes the research and, in fact, is shaped by the research." (p.206). In light of this assumption, I am going to write my personal journey and talk about my professional career, and how it reflects on this study.

I graduated from Elementary Science Education Department at Middle East Technical University in 2009, and then I worked as a public school teacher for one year. At the same time, I began to study master's degree at the same department in Sakarya University. I thought that this would provide me with better understanding

of teaching practice, and also,I could have the authority to conduct research in my own classroom, which would enable me to get more data anyone could ever do.Although the idea of being a teacher researcher was really attracted to me, it was also very difficult because I had a lot of work to do in limited time and I needed to have much time for my training as well. Then, I decided to make a choice between being a teacher and being a researcher and to continue with my academic career but at the different department, namely Curriculum and Instruction. The underlying reason that I changed the department was related to that I want to improve my in-depth understanding of curriculum, curriculum development, curriculum evaluation, instructional models, etc. Because Turkish education system was highly centralized and the top-down curriculum is developed by Ministry of National Education, teachers have to deliver it as it should be. Hence, understanding of what curriculum says seems to be essential for intended teaching. I realized this fact and the importance of having curriculum literacy when I was a teacher. This was my motivation for studying in this major area.

After taking some courses from the department, I noticed that the knowledge and experience I acquired when I was a teacher was very helpful for me to develop a range of practical skills for my academic career. One of the most important one is to be aware of current problems in education system, some of which I experienced in my classrooms. This became more meaningful after I took some courses from the department. There was a seminar about comparison of disaster education in Turkey and in Japan. This reminded me that I paid little attention to disaster-related issues even though I was a science teacher and where I worked is an earthquake-prone region.Then, I decided to conduct a research study related to disaster education in Turkey. I asked for an advice from the instructor that organized the seminar and she mentioned briefly about the school-based disaster education project that she was involved in voluntarily. In the first place, I thought that I could develop some educational materials for disaster education, and then I could evaluate their effectiveness on students' awareness. However, in the light of the literature review I realized that there are other barriers in relation to disaster education in Turkey to be

examined. Thus, with the help of my advisor I decided to carry out this case study so that we could examine the current status of disaster education thoroughly.

CHAPTER 4

RESULTS

This chapter presents the results of the study. The data obtained through the students' questionnaire have been analyzed using descriptive statistics and were presented. Making interviews with three students supported quantitative data.

4.1 Results on Students' Knowledge about Disaster-Related Issues

This study was aimed to explore what students know about disaster-related issues. In the questionnaire, there were 16 items, among which 8 items were given as open-ended. In this part, the results were reported in a way of comparing students' knowledge on the issue from two schools using different approaches to disaster education (School A, uses extra-curricular activities besides formal one, andSchoolB use formal curricular education).

4.1.1 Definition of the disaster concept.

Analysis of data elicited four core codes: hazard belief; potential hazard impact; acceptance of fate; and preparedness as seen in table 4.1.

Table 4.1 *The Most Frequently Recurring Codes Related to Disaster Concept*

Coding Themes		**School A (*n*=213)**	**School B (*n*=90)**
		Count	**Count**
Hazard belief	Hazards can be human-made	10	2
	Natural events such as earthquake, flood, landslide etc.	253	52
	Natural eventsthat are created by God for punishment	2	22
	Natural events that maintain balance of nature	10	-

Table 4.1 (cont'd)

Coding Themes		School A (*n*=213)	School B (*n*=90)
		Count	Count
Hazard Belief	Natural events occur suddenly	26	11
Potential hazard impact	Natural events that affect our lives negatively	97	15
	Natural events that cause loss of life and property	95	17
	Natural events that causes damages emotionally	-	10
Acceptance of fate	Natural event that we can do nothing in order to prevent it	14	26
	Hazards are out of human control	3	11
	Act of God	10	23
Preparedness	Natural events that we can prepare against their potential damages	52	30

The hazard beliefs are related to what students consider hazards to be. Most of the students from both schools mentioned geological and meteorological hazards including earthquakes, floods and landslides. They limited the disaster concept to natural events and most of the students ignored human-based hazards, such as fires, accidents, terrorism, chemical attacks, etc.However, it was revealed that students from SchoolA swayed more toward human-based hazards comparing to students from control group school.

Furthermore, oneof the dominant beliefsemerged from data under the hazard beliefs was related to religious beliefs. Some students made immediate mention of natural events that created by God for punishment of people's sin.The number of

students from School B who have such belief are greater than students from SchoolA. On the other hand, some students from School A thought that natural balance are maintained through hazard events and explained the physical mechanism of earthquake occurrence as stating that "Earthquakes happen because the earth' plates move." Similarly, some students from School A emphasized the possible relationship between occurrences of two natural events as saying that "Earthquakes occur as a result of landslides". In addition,some students believed that natural events occur suddenly and there is not any warning time or they cannot be forecast.As a result, the number of students from School A who have such belief are greater than the number of students from School B do so.

Potential hazard impact coding theme as the name implies are more aligned to students' understandings about the negative impacts of disasters on themselves or people around them. As seen in table 4.1, while more students from School A believed that hazard events have negative impacts on their lives and causes a lot of physical damages, destructions or devastations, students from School B emphasized more psychological impacts of hazards.

The third coding theme is acceptance of fate, which describes students' feelings of lack of control about disasters by saying that natural events were act of God, individuals cannot do anything about them, or they had no control over hazards. More students from School B made references to ideas around lack of control over hazards do comparing to students from School A.Similarly, one of the student interviewees from School A perceived the major driving force to an earthquake for disaster events as not being prepared. He articulated the concept: "Disasters occurs because we are not prepared against them. For instance, we can plant trees to hold soil down for landslides or floods. So, we should protect our forestlands"

On the other hand, some students focused on preparedness and described the concept of disaster as natural events that people can be prepared against their negative consequences. When we compare students from different schools, more students from School A recognized that being prepared could help in the times of disasters than students from School B.

4.1.2 Students' perceptions of the most likely disasters that affect them.

A high proportion of School A students (*n*= 232) and School B students (*n*= 84) perceived earthquake as one of the most likely hazards to affect themselves. Both school reported that erosion is less likely hazards that they are affected as seen table 4.2 below (n_A= 14, n_B= 10).

Table 4.2 *Frequencies of the Most Likely Disasters Occurred in the Region That Students Reported*

	School A (*n*=251)		**School B (*n*=95)**	
	f	***%***	***f***	***%***
Flood	37	14.7	19	20
Earthquake	232	92.4	84	88.4
Fire	109	43.4	49	51.6
Erosion	14	5.6	10	10.5
Landslip	18	7.2	12	12.6

4.1.3 The impacts of the most likely hazard that occur their hometown.

The data identified diverse viewpoints about potential impacts of the most likely hazard that occur in the region, which was referred to earthquake. The majority of students from both schools (n_A= 249, n_B=90) perceived possible consequences from an earthquake to be severe, with only nearly a quarter (n_A= 62, n_B= 23) not expecting suffer harm from earthquakes if house structure is solid as seen in the table 4.3.

Table 4.3 *Frequencies the Impacts of Earthquakes on Students, Their Families, Their Schools, and the Environment That They Live*

Coding Themes		School A (*n*=251)	School B (*n*=95)
		Count	**Count**
Physical Impacts	Death / Injuries	249	90
	Property damages / destruction	247	51
Social Impacts	Continuation of education	168	38
	Psychological damages	235	52
	Community cooperation	66	10
	Learn from past experiences	25	7
	Migration	15	6
Economic Impacts	Unemployed teachers	14	26
	Prevention in economic development	157	48
Environmental Impacts	Damaged trees / animals	213	58
	Change in the earth's structure /its shape/sea level	4	-
	Pollution	6	6
No impacts	Strong buildings	62	23

A high percentage of students from both schools focused on physical impacts of earthquakes by saying that "people get injured or die because of natural hazards" (n_A= 249, n_B= 90) or "earthquakes cause buildings to collapse" (n_A= 247, n_B= 51) and psychological impacts by saying that:

> "As a result of an earthquake, people lose somebody that they love, father, mother, sister, children, etc. I cannot imagine what to do when this happens to me. I would feel depressed and upset.

or

> "If I die in case of an earthquake, my mom, dad, and brother would be sorry and cry a lot. They would move to another city so thatthis could not happen again through their lifetime."

Furthermore, a high proportion of students from School A(*n*= 213) and more than half of the students from School B(*n*= 58) reported another major potential earthquake impact as environmental damages caused by earthquakes by saying that"people are not the only living things affected by natural hazard, they also displace many animals who live in that area" or "animals and trees are likely to be damaged as a result of a hazard".

In addition, more than half of the School A students (*n*=168) and nearly half of the School B students (*n*= 38) mentioned negative impacts of disasters on education by saying that "if our school building is collapsed because of an earthquake, we cannot continue our education" or "my mom worries about the safety of school building when I come to school because she experienced the '99 earthquake and my dad was not here, stayed in Ankara and she is afraid ofit happens again and I cannot make itby myself when I'm at the school".

The data also revealed the economic impacts opposed by earthquakes and more than half of the students from School A(*n*=157) and half of the students from School B(*n*= 48) reported that disasters have negative impacts on economic development. Another remarkable point regarding the economic impacts of disasters was found that some students (n_A= 14, n_B= 26) relates disaster events to teachers' being likely to unemployed by saying that "when an earthquake strikes, our school building may be destroyed, then our teachers become unemployed".As seen from table 4.3, more School B students than School A students held such thoughts about economic impacts of hazards.

Additionally, while students' thoughts about impacts of natural hazards were predominantly negative, some students (n_A= 66, n_B= 10) looked from different point of view, whose thoughts reflected more optimism. They mentioned that natural hazards could lead to community cooperation, which was reflected in one of the 8th grade students from School A stating that:

> "I heard news of Van earthquake occurred last year on the TV and there were volunteer people from all over the country helping people in the area recover their injuries… There were activities and TV programs made to provide financial support for accommodation expenses, foods, etc.... There was a close bond between volunteer people and victims."

Another important aspect of impacts of disasters found in this study was learning from past experiences (n_A= 25, n_B= 7).Furthermore, some students considered that people who experiences disaster events generally respond to them through migration by saying that "people who experience natural hazard do not want to stay there anymore because they worry about what if in the next time things goes wrong." As a result, the number of students from School A (*n*= 15) who connected migration and natural hazard was greater than the number of students from School B(*n*= 6) who had a similar idea.

Few students from both schools (n_A= 6, n_B= 6) associated the disasters with environmental pollution for some reason but there is not any further explanation of how these two aspects were related to each other. There is another aspect under environmental impacts of disasters emerged in this study. Few students from School A (*n*= 4) formed a rationale that natural hazards could result in change in the Earth by saying that "earthquakes can cause raising or lowering land areas", or"earthquakes change sea levels", or "earthquake cause erosions", or "cause landslides."

4.1.4 Communication with friends and family members about disaster-related issues.

The data revealed that a high proportion of School A students (*n*= 180) and School B students (*n*= 57) have discussed disaster-related issues with their friends. Furthermore, Three quarters (*n*= 71) of School B students reported having discussed disaster-related issues in the home with their parents compared to 79.5% of students from School A (*n*= 198).

Table 4.4 *Frequencies of Students' Discussing Disaster-Related Issues with Friends / Family Members*

	School A				**School B**			
	Friends		**Family**		**Friends**		**Family**	
	f	**%**	***f***	**%**	***f***	**%**	***f***	**%**
Yes	180	72.3	198	79.5	57	60.0	71	74.7
No, intend to do	46	18.5	33	11.4	23	24.2	13	13.7
No	23	9.2	18	7.2	15	15.8	11	11.6
Missing	2	.8	2	.8	-	-	-	-
Total	251	100.0	251	100.0	95	100.0	95	100.0

4.1.5 Implementation of disaster education in their school.

In this question, students were asked to report the sufficiency level of curricular and extra-curricular activities on disaster-related issues as shown table 4.5. According to a high proportion of students from School A (*n*=205), curricular activities were enough as it should be. However, nearly half of the students from School B (*n*=47) thought that there were some curricular activities but they were not enough as it should be. In addition, while more than half of the students from School A (*n*=136) claimed that extra-curricular activities on disaster-related issues were enough, nearly half of the students from School B (*n*= 38) reported that there were some extra-curricular activities, but they were not enough as it should be.

Table 4.5 *Frequencies of Sufficiency Level of Curricular-Activities and Extra-Curricular Focusing on Disaster-Related Issues*

	School A				**School B**			
	Curricular Activities		**Extra-curricular Activities**		**Curricular Activities**		**Extra-curricular Activities**	
	f	***%***	***f***	***%***	***f***	***%***	***f***	***%***
Enough	205	82.3	136	55.5	25	26.3	18	18.9
There are some training but not enough	39	15.7	75	30.6	47	49.5	38	40.4
Not at all	5	2.0	34	13.9	22	23.2	38	40.4
Missing	2	.8	6	2.4	1	1.1	1	1.1
Total	251	100.0	251	100.0	95	100.0	95	100.0

A high proportion of students from School A(*n*=144) reported that disaster education was highlighted in the school through many major courses such as Social Studies, Life Sciences, Science and Technology, Turkish, English, and Mathematics courses. Some students (*n*=31) claimed that disaster-related education was taught through students clubs in the school, such as civil defense student club, the Red Crescent student club, the Green Crescent student club, etc. Several students from School B (*n*=34) stated that Social Studies course and Science andTechnology course have some topics related to disaster education and some students (*n*=24) claimed that curricular activities did not emphasize disaster-related issues as it should be. Very few students from School B (*n*=5) implied that disaster-related education was placed in some student clubs, such as civil defense student club, traffic and first aid student club, etc.

Furthermore, some students from School A (*n*=26) mentioned that school counselor teacher informed them about disaster-related issues and 5 of them specified that the school counselor teacher provided psycho-educational trainings for both students and their parents. Very few students (*n*=9) indicated that disaster

management specialist, such as civil defense expert, and guests from fire station were invited to talk about their experiences.

Moreover, students pointed out what kind of information related to disasters was taught through curricular activities.The majority of School A students (*n*=247) focused on information about some form of protective response for earthquakes, such as taking protective actions (e.g., taking cover under table, staying away from windows, not using elevators, and holding on until shaking stops). On the contrary, some students from School B (*n*=25) stressed on finding their parents or teachers without taking any of them. Apart from that, very few students from School A(*n*=12) and students from School B (*n*= 3) were stated that they learned emergency telephone numbers, such as 112 for any kind of emergency, 110 for fire call, 155 as police emergency line, etc. in the lessons.

In addition, table 4.6 presents information on what type of extra-curricular activities regarding disaster education conducted in the School A. A majority of students (*n*=157) reported that there is a pictogram on canteen walls at the school including information about protective response actions during and after an earthquake. Almost one half of the students (*n*=109) claimed that several contests (e.g., chess contest, creating a slogan, preparing poster, acrostic contest, and performing rap music) were organized at the school within the scope of disaster education. More than one third of students (*n*=94) stated that they visited to the earthquake simulation center in İzmit aiming at improving people's coping skills in order to reduce injuries or damages posed by earthquakes. They learned emergency first aid and how to protect themselves after an earthquake in real settings. One of the students captured his positive feelings about visiting the simulation center by saying that:

> "When we visit the simulation center in İzmit, we experienced a real earthquake shaking and we took a chance to evaluate how we have sufficient knowledge and skills to prevent getting injured during an earthquake."

Table 4.6 *Extra-Curricular Activities in School A*

	Coding themes	**Count (*n*=247)**
Extra-curricular activities	Field trip	15
	Simulation center	94
	Create a contact card	18
	Prepare a notice board	27
	Pictogram	157
	Memorial event	10
	Panel discussion	26
	Engaging in contests	109

Furthermore, the analysis of interview data obtained from teachers and the document analysis elicited 10 extra-curricular activities conducted within the scope of the project in the School A as follows:

Preparing an emergency kit.

The 2nd grade class teacher developed an extra-curricular activity for the life science course, aligned with the objective "At the end of the lesson, students know disaster preparedness measures." In the activity, students were supposed to prepare an emergency kit. In the first place, students decided which supplies should be included in the kit and then they provided those supplies to prepare their own emergency kit and bring it to the class. At the end of the activity, students were supposed to learn necessary supplies that they could use in the times of an emergency and have their own emergency kit. They also learnt how to use each item included in the kit.

Designing a poster.

The art teacher wanted students to design a poster about protection ways from a disaster event that students chose. Students were supposed to make some research on how to protect from a disaster, and what to do to be more prepared against its negative impacts. Then, they designed their posters showing their research and found a slogan for each poster. Students also needed to provide references that they used on their posters. After that, each poster was shared with other students at the school. There were several photos showing the whole process from designing the posters to exhibiting them (See Appendix H).

***Pictogram*.**

In order to teach what to do pre-, mid-, and post- actions to be taken in the times of an earthquake, in the life science course at 2nd and 3rd grade, students were asked to examine pictograms on the canteen walls including safety-behaviors for earthquakes and then, they were supposed to discussed and categorized which actions should be taken before an earthquake, which ones should be taken during an earthquake, and which ones should be taken after an earthquake. After that, teacher divided students into groups and asked them to share pictograms for each situation and to glue them on the cardboards. Then, they painted the pictograms after naming each of them. At the end of the activity, students shared their works with their friends through an exhibition. Moreover, the researcher took some photos showing the pictograms placed on the canteen wall.

Acrostic competition.

TheTurkish teacher and one of the class teacher held an acrostic competition related to natural hazards that all students from first grade to 8th grade level could participate in. Students were supposed to make some research about natural hazards and use this information in their works. Through this activity, students were assessed according to their creativity, what they know about natural hazards, and their skills on using language properly. The teacher took some photos presenting students' working on the task (See Appendix I).

Danger hunt.

In the civil defense student club, students were asked to discuss the dangerous points in the school, including the canteen and the garden. They drew the sketch of the school and showed the dangerous places on it. Also, they determined the safer points in the school and decided that their assembly area in the school garden that they are planning to come together after an earthquake is safe enough. Then, they shared their works with their friends. While students were working on the task, the teacher took their photos displaying the whole process (See Appendix J).

Rap music competition.

Themusic teacher prepared a rap music competition at 4th grade through 8th grade. Students were asked to compose a rap music showing their knowledge about

safety-related actions to be taken for earthquakes. Each competitor performed his / her song in front of the whole school.While students were performing their songs, the teacher took some their photos (See AppendixK).

Discussion.

The Turkish teacher held a discussion session about the major driving forces of disasters. Students were divided into two groups, one of which argued for that the major driving force of disasters is not being prepared enough against them and one of which agreed on the idea that even if people are prepared well for disasters, they are still likely to get hurt from them, that means that being prepared does not change their negative impacts. Each group made some research to collect evidences for validating their argumentations. As a result of the debate, it was agreed upon that being prepared could prevent the adverse impacts of disaster events and make difference between life and death. The teacher took some photos showing groups' performances during the discussion session (See Appendix L).

Preparing a school board.

School board including various kinds of information on disasters, protection ways from them, preparedness activities, were developed. The psychological counseling and guidance teacher mentioned the school board focusing on disaster-related issues by saying that:

> "For example, we designed a school board related to disaster preparedness measures. We aimed to inform students about various types of disaster events. We try to update it as much as possible."

Memorial Day.

The psychological counseling and guidance teacher talked about holding a memorial day at the school for the following term. In Gölcük, there is a memorial day for victims of '99 Istanbul earthquake held once a year. She mentioned that they were inspired by this Memorial Day activity aiming at transmission of the experiences of the '99 earthquake and encouraging students to be more prepared for possible future earthquakes. She explained her future plans about this activity by stating that:

> "…We are also planning to organize a memorial day at the school. The purpose of this event is to inform both students, teachers and as well as

> parents about disaster protection and preparedness ways and we are planning to invite people affected by that earthquake to share their experiences with others and provide an interactive environment for people to learn from others' experiences and take lessons from them. We should consider some amusing learning activities so that students do not feel fear on disaster-related issues."

Civic defense student school club.

Students in the civic defense school club get trainings about disaster-related issues (e.g. drop-cover-hold position, natural disasters, preparedness activities, etc.) and teach them to their friends and classmates. The psychological and counseling teacher articulated immediately:

> "We organized several trainings for parents, teachers and students. We preferred something different in the students' trainings. Instead of training students by teachers, we chose several students and trained them. And then, they trained their friends. Sometimes, children listen to their friends more carefully. Our students from civil defense student club did this. They showed the safety-related behaviors to students from lower grade. They informed their classmates about natural hazards, man-made hazards, the protection ways from their negative impacts, preparedness measures for each hazard type. We took advantage of students in that way. I think it was very beneficial for students."

Disaster mitigation measures in School A.

In the school, several preparedness measures in the traditional emergency management sense were identified to get ready for a disaster, particularly future earthquakes. A significant number of students (*n*=178) mentioned collecting survival items (e.g., food, water, clothes, phone cards, radio, batteries, medication, torches, and whistle) and creating an emergency kit. A high proportion of students (*n*=129) linked preparedness actions to securing items (e.g., securing furniture to walls, and locating desk away from windows). Some students (*n*=62) focused on undertaking safety actions after an earthquake shaking (e.g., determining assembly area and emergency exits). Very few students (*n*=5) discussed about creating an emergency plan for both school and family. Only 2 students referred to preparedness measures for a fire and stated the importance of having a fire extinguisher. On the other hand, in School B, only 4 students made reference to two actions for disaster mitigation; creating an emergency kit and installing a fire alarm system.

4.1.6 Impacts of disaster education.

When students were asked about impacts of disaster education, almost all students from both schools reported that disaster education programs had some positive impacts on themselves. Table 4.7 shows seven positive impacts that children reported. Only three students from School A and two students from School B considered that nothing has changed because of disaster education programs.

Table 4.7 *Impacts of Disaster Education Reported by Students from School A and B*

Coding Themes		School A (*n*=241)	School B (*n*=52)
		Count	**Count**
Positive impact	Knowinghow to response to earthquakes	233	29
	Being more prepared	61	10
	Making practice	39	-
	Need for preparedness	68	24
	Encouraging sharing disaster-related information	24	-
	Raising in awareness	14	5
No impact	No changes	3	2

A higher proportion of students from School A (*n*=233) and from School B (*n*=29) reported that through disaster education activities they know what to do when an earthquake strikes and they learned undertaking specific preparedness actions,especially for earthquakes. One quarter of students from School A (*n*=61) considered themselves well prepared after participating in disaster education programs. On the contrary, only 10 students from SchoolB reported that disaster education have positive impacts on being more prepared for disaster events and more cautious about undertaking protective measures.Furthermore, while some students linked disaster education with ensuring safety, others linked disaster education with

decrease in fear for natural hazards. These two concepts are associated with justification of the need for preparedness. 68 students from School A and 24 students from School Breported that they feel safer and they do not fear for natural hazards anymore.Although disaster drills are compulsory in schools, only 39 students from School A reported that disaster education gain experiences and make them practice through disaster drills exercises. In addition, it is revealed that disaster education programs including extra-curricular activities increases in communication between students and parents. 24 students from School A out of 241 students reported that teachers encouraged them to share related information about disaster preparedness and response measures with their parents and friends.Similarly, the class teacher described that one of the major impacts of the project on students was encouraging students what they learned from the activities with their families by saying that:

> "Students learned many of things from these activities. They raised their awareness. I think they behave properly and undertake some responsibilities about the issue. The project increased the knowledge level of students regarding both content and practical issues. They learned basic form of preparedness measures for different types of disasters. They shared what they learned from the trainings with their parents. They made some home-based preparedness adjustments. Through evacuation drills, they made practices of safety-related behaviors for earthquakes. Before the project, we also conducted some evacuation drills but both teachers and students, after the project, took them seriously. So, this project helped to realize both the importance of taking pre-, mid-, post- disaster preparedness actions and of making practices. For example, nobody knew putting desks away from the windows for protection from earthquakes and students learned it through these activities. These are all positive impacts of the project on our children."

Moreover, very few students from both schools (n_A=14, n_B=5) reported that disaster education raise their awareness about hazards, protection ways from them, response actions to them, recovery of their negative impacts, etc. When teachers were asked about the impacts of curricular and extra-curricular activities conducted within the scope of the project at School A, most of them claimed that those activities raise students' awareness about disaster-related issues. The school counselor directly stated that:

> "I think these activities raise students' awareness. For example, I liked the consequences of trainings that we gave. In some classes, after

> trainings, students immediately put their desks away from windows approximately 60 cm. In fact, other teachers were surprised and did not understand the reason behind this action. Students explained their reasoning. I mean, this small action showed us we did great job."

Moreover, an English teacher described her thoughts about the impacts of these activities on students:

> "Until now, we did not realize the changes in students perceptibly but I noticed the positive impacts of these activities on students when they filled in the questionnaire… Some information was imprinted on their brains, which was really good. For example, not being panic, not running down the stairs, not staying near the windows, firstly, taking drop-cover-hold positions…They really made progress. I think, students did not have any of this information about disaster-related issues before. But, even if we did not accomplish a hundred percent success, their awareness was raised absolutely."

4.1.7 Students' knowledge on preparedness measures against disaster events.

In this part, students' knowledge about preparedness measures against various disaster events, such as earthquakes, floods, fires, landslides, and avalanches were reported.

Preparedness measures for earthquakes.

Analysis of data for this question elicited three main coding themes, named as house structure, non-structural measures, and hazard hunt. Table 4.8 lists preparedness mitigation activities that people should undertake for earthquake. All students from School A and almost all students from School B (n=92) reported that house building should be made of strong building materials as one of the important preparedness structural measures. Although most of the students from both schools pointed out traditional earthquake preparedness measures and made reference to securing items, and collecting earthquake supplies, School A students have broader conceptualizations of earthquake preparedness by saying, "prepare a family earthquake and evacuation plan, determine emergency exits, assembly areas, prepare a contact card, and share what they learned from school with their parents and friends."

Table 4.8 *Preparedness Measures for Earthquakes*

Coding Themes		School A (*n*=251)	School B (*n*=95)
		Count	**Count**
House structure	Made of strong building materials	251	92
	Low-rise building	88	12
	Check on building foundation	170	30
Non-structural Measures	Earthquake insurance	19	-
	Lifesaving training	53	15
	Practice for an earthquake at home / school	55	10
	Family earthquake and evacuation plan	27	-
	Emergency telephone numbers	9	2
	Determine emergency exits	5	-
	Sharing information with parents	7	-
	Earthquake supplies kit	249	56
	Locate safe spots in the house	25	12
	Prepare a contact card	16	-
	Determine assembly areas	39	-
Danger Hunt	Store hazardous materials safely	41	-
	Move beds away from windows	98	2
	Secure items	234	13

Table 4.9 lists home-based preparedness measures to be taken against earthquakes. A majority of students from both schools reported preparing a family disaster plan (n_A = 207, n_B= 57), providing a first aid kit (n_A = 197, n_B = 41), fastening heavy items to the walls (n_A = 193, n_B = 54), storing emergency supplies, such as flashlights, a portable radio, batteries, a fire extinguisher, fresh water, and non-perishable foods handy (n_A = 188, n_B = 48), insuring the house (n_A = 175, n_B = 46), having someone in the family learn to provide first aid (n_A = 173, n_B = 44), storing hazardous material safely (n_A = 167, n_B = 47), getting an expert to determine if there are signs of structural defects (n_A = 179, n_B = 43), and picking an emergency

contact person outside the area (n_A = 163, n_B = 41). As a result, the number of students from School A reported physical measures that can be taken to reduce household damage was greater than the number of students from School B. However, some key earthquake hazard adjustments, such as providing a house plan including emergency exists, where to meet after an earthquake, where gas, water and electricity appliances are located were reported by the students from both schools to be less adopted (n_A= 148, n_B = 33).

Table 4.9 *Frequencies of Home-Based Preparedness Measures against Earthquakes Reported by Students*

Home-based Measures	**Yes**				**No, but I intend to do**				**No**			
	School A (*n*=251)		**School B (*n*=95)**		**School A (*n*=251)**		**School B (*n*=95)**		**School A (*n*=251)**		**School B (*n*=95)**	
	f	***%***	***f***	***%***	***f***	***%***	***f***	***%***	***f***	***%***	***f***	***%***
Family disaster plan	207	83.5	57	60.6	28	11.3	19	20.2	13	5.2	18	19.1
Store hazardous materials	167	67.3	47	50	62	25.0	22	23.4	19	7.7	25	26.6
Secure items to walls	193	77.8	54	57.4	47	19.0	21	22.3	8	3.2	19	20.2
First aid kit	197	79.4	41	43.6	42	16.9	37	39.4	9	3.6	16	17.0
House plan	148	59.7	33	35.1	80	31.9	28	29.8	20	8.1	33	35.1
Earthquake insurance	175	70.6	46	48.9	50	20.2	18	19.1	23	9.3	30	31.9
Store emergency supplies	188	75.8	48	51.1	48	19.4	26	27.7	12	4.8	20	21.3
Get expert advice	179	72.2	43	45.7	55	22.2	29	30.9	14	5.6	22	23.4

Table 4.9 (cont'd)

Home-based Measures	Yes				No, but I intend to do				No			
	School A (*n*=251)		School B (*n*=95)		School A (*n*=251)		School B (*n*=95)		School A (*n*=251)		School B (*n*=95)	
	f	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*	*f*	*%*
Learn first-aid	173	69.8	44	46.8	59	23.8	32	34.0	16	6.5	18	19.1
Emergency contact person	163	65.7	41	43.6	49	19.8	24	25.5	36	14.5	29	30.9

In addition, in this question there was an option for each item, labeled as "no, but intend to" for distinguishing students who have not taken any of these home-based preparedness but they have intend to do so and students who did not take any of them at all. Therefore, another remarkable point was revealed that the number of students from School B who responded to each item of the question as "no" instead of "no, but intend to" was greater comparing to students from School A who responded to the question in a similar way.

Preparedness measures for floods, fires, landslides and avalanches.

The response rate of students from both schools for preparedness measures for other types of disaster events was lower comparing to earthquake one. Table 4.10 presents students' viewpoints about what to do to be more prepared against floods, fires, landslides and avalanches.

Table 4.10 *Preparedness Measures for Floods, Fires, Landslides and Avalanches*

Disasters	Preparedness Measures	School A (*n*=231)	School B (*n*=78)
		Count	Count
Floods	Avoid building in floodplain	43	15
	Construct barriers	7	-
	Keep storm drains free of leaves	5	-
	Plant trees	101	30
Fires	Install fire alarm system	5	2
	Have emergency stairway	7	-
	Have a working fire extinguisher	59	11
	Clear items such as barbecue grills, glass etc. that cause wildfire from forest	39	18
	Warn children keep away from lighter	12	3
	Employ forest fire fighter	4	2
	Use fire resistant materials on trees	6	-
	Not using electricity illegally	-	2
Landslides & Avalanches	Do not build near steep slopes, close to mountain edges, near drainage ways, or natural erosion valleys	18	-

A high proportion of students from both school (n_A= 101, n_B= 30) reported the importance of planting trees by stating "we can prevent occurrence of floods when we plant lots of trees". In addition, some students from both schools (n_A= 43, n_B= 15) emphasized the importance of avoiding of buildings in floodplain for protection from floods.

While a majority of students from School A (*n* = 59) paid attention to having a working fire extinguisher for protection from house fires, several students from School B (*n* = 18) reported the importance of clearing items, such as barbecue grills, glass etc. from forest in order to prevent wildfires.

Several students from School A (*n* = 18) pointed out some protection ways from landslides and avalanches by stating that "we can prevent the occurrence of landslides and avalanches when we do not build our houses near steep slopes, close to mountain edges, near drainage ways, or natural erosion valleys".

4.1.8 Students' knowledge on protective behaviors for disasters.

In this question, students were asked to report safety behaviors to be taken in the times of an emergency. Students generally focused on earthquake protective actions and only some students mentioned some form of correct actions to be more protected from house fires and floods.

Protective behaviors for earthquakes.

Table 4.11 below displays the various actions taking in case of an earthquake reported by students from both schools. Many of the students reported more than one response, such as taking protective actions (drop to the ground, take cover by getting under a table or other piece of furniture and hold on until shaking stops or stayed where you were and waited for it to be over). However, 5 students from School A and 18 students from School B reported going to find their parents without taking some forms of protective action.Furthermore, most of the students from both schools (n_A = 220, n_B = 50) highlighted the importance of staying calm during an earthquake. However, some students from School A (n= 6) specified some different actions to be taken (keep the kit with you, and turn off electricity, gas and water utilities) which any of students from School B did not mention at all. Furthermore, some misconceptions were emerged from the data obtained from SchoolB students. Some students (n=7) reported erroneous actions, such as moving top of the building, and going outside during shaking.

In addition, some students from School A clarified categorized protective actions against earthquake regarding the place where they stay. Up to now, we are talking about some forms of protective actions if they stay inside of a building. When they stay outside of the building in case of an earthquake, 48 students from School A reported the importance of staying the outside of buildings and moving away from them.

Table 4.11 *Safety Behaviors During and After an Earthquake Reported by Students*

Coding Themes			School A (*n*=251)	School B (*n*=95)
			Count	Count
During Earthquakes	**If Indoors**	Drop-Cover-Hold on	177	6
		Stay safe spots and wait	158	40
		Stay calm	220	50
		Call for help	1	1
		Keep earthquake kit	25	-
		Turn off utilities	6	-
		Do what care giver says	10	-
		Find parents	5	18
		Move top of buildings	-	7
		Do not stay inside	-	12
	If Outdoors	Stay where you are	13	-
		Move away from buildings	35	-
After Earthquakes		Exit the building	170	27
		Call for help	32	34
		Help injured people	25	8
		Listen to radio or TV	1	-
		Telephone only for emergency calls	3	-
		Stay away from damaged areas	48	6
		Go to assembly areas	94	-
		Not use elevator	82	-
		Stay calm	45	17
		Use only emergency exists	3	-

Table 4.11 (cont'd)

Coding Themes		School A (*n*=251)	School B (*n*=95)
		Count	Count
After Earthquakes	Check for gas leaks	9	-
	Look for electrical system damage	9	-
	Assess damage	3	3
	Check people around you	19	-
	Inform family members	4	1
	Under debris, whistle	26	-
	Under debris, wait to be rescued	-	8
	Move top of the building	1	-

Moreover, students were supposed to answer what to do after an earthquake and it was revealed that most of students from both schools knew some basic form of correct actions after the quake (e.g., when the shaking stops, make sure it is safe to move and then exit the building, stay away from damaged buildings, and stay calm). However, there were some distinctive safety-related responses given by School A students, which any students from School B did not mention at all (e.g., go to assembly area determined before, do not use elevator, use only emergency exits, check for gas leaks, look for electrical system damage, check people around you whether they are ok, and inform family members if you are separated from them).

One student from School A paid attention the case of not exiting the building and reported that if I could not exit the building, I would move top of the building. Another remarkable point emerged from the data was related to some form of safety behaviors in case of staying under the debris. Some students from School A (*n* = 26) emphasized that letting authorities notice them by whistling. On the other hand, some students from School B (*n* =8) preferred waiting to be rescued from there.

Protective behaviors for fires and floods.

Some student from School A reported some protective behaviors for fires and floods. Several students (*n*=5) knew some correct actions for floods by stating, "move to the area higher than the flood level" or "stay inside wait to be told what to do". Furthermore, some students reported knowledge of some correct actions for

house fires by saying that "crawl low under any smoke to the short exit (*n*=2)", "protect yourself from smoke by taking a wet t-shirt and placing it over your nose and mouth (*n*=2)", "call fire department (*n*=5)" and "use fire extinguisher (*n*=3)".

4.1.9 Students' feelings about being responsible to protect themselves from disasters.

As shown in table 4.12 below, a majority from School A (*n*=216) reported that they feel themselves responsible to protect themselves from disasters. Similarly, more than half of the students from School B (*n*=61) reported their feelings about being responsible to protect themselves against disaster events.

Table 4.12 *Frequencies of Students Reported That They Feel Themselves Responsible about Disaster-Related Issues*

	School A (*n*=251)		**School B (*n*=95)**	
	f	***%***	***f***	***%***
Yes	216	86.7	61	65.6
No	33	13.3	32	34.4
Missing	2	.8	2	2.1
Total	251	100.0	95	100.0

4.1.10 Students' perceptions of their sufficiency level of disaster preparedness, response and recovery issues.

Table 4.13 below displays the frequencies of students from both schools that whether they feel themselves sufficient about disaster preparedness, response and recovery issues. It was revealed that although a majority of students from School A (*n* = 188) reported that they feel themselves sufficient about disaster-related issues, more than half of the students from School B (*n* = 45) reported that they do not feel themselves as sufficient as students from School A.

Table 4.13 *Frequencies of Students' Self-Sufficiency about Disaster Preparedness, Response and Recovery Issues*

	School A (*n*=251)		**School B (*n*=95)**	
	f	***%***	***f***	***%***
Yes	188	75.5	45	48.4
No	61	24.5	48	51.6
Missing	2	.8	2	2.1
Total	251	100.0	95	100.0

4.1.11 Additional resources for further information about disaster-related issues.

Apart from schools, students were asked about what other resources they use to get information about disaster-related issues that they wonder, as shown in the table 4.14 while a higher proportion of students from School A (n = 203) used the Internet for this purpose, a majority of students from School B (n = 61) talked to their family members and gained further information from mass media, such as TV, and newspaper, etc.

Table 4.14 *Frequencies of Information Resources for Disaster-Related Issues Reported by Students*

Resources	**Yes**				**No, but intend to do**				**No**			
	School A		**School B**		**School A**		**School B**		**School A**		**School B**	
	f	**%**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**	***f***	**%**
Family member	188	74.9	61	66.3	33	13.1	12	13.0	26	10.5	19	20.7
Friends	161	65.2	49	53.3	46	18.6	22	23.9	40	16.2	21	22.8
Books	176	71.0	50	54.3	38	15.3	17	18.5	34	13.7	25	27.2
The Internet	203	82.2	59	64.1	15	6.1	17	18.5	29	11.7	16	17.4
Mass Media	192	78.0	61	66.3	24	9.8	14	15.2	30	12.2	17	18.5

4.1.12 Students' perceptions aboutnecessity of disaster education.

Students were asked about the necessity of disaster education, two main categorizes were emerged from the data as shown in the table 4.15. A majority of students from both schools (n_A = 100, n_B = 44) reported that disaster education is necessary because people become more prepared against disaster events. Furthermore, a high proportion of students from both schools (n_A = 68, n_B = 38) thought that disaster education is necessary because it raises their awareness about disaster-related issues. In addition, some students from both schools (n_A = 40, n_B =37) reported the reason behind the necessity of disaster education as being aware of some protective behaviorsfor emergencies. However, only 3 students from School A emphasized the necessity of disaster education by stating, "People can learn how to help disaster victims and show empathy for them". On the other hand, there were several students from both schools (n_A = 2, n_B = 17) thought that disaster education is not necessary because building structure is more important for being protected from disaster events.

Table 4.15 *Necessity of Disaster Education*

Coding Themes			**School A (*n*=193)**	**School B (*n*=71)**
			Count	**Count**
Necessity of Disaster Education	Necessary because	Learn how to stay calm	29	11
		Provide practice	21	14
		Feel safe	25	15
		Raise awareness	68	38
		Be more prepared	100	44
		Learn what / how to do	40	37
		Learn how to help disaster victims	3	-
	Not necessary because	Good building structure more important	2	17

4.2 Results on Teachers' Approaches to Disaster Education

In the present study, six teachers from School A were interviewed about impacts of school-based disaster education on themselves, their approaches to disaster education, the school's structural and nonstructural preparedness measures. In this part, the results obtained from interviews with the teachers were clarified.

Impacts of the disaster education on teachers themselves.

When the teachers were asked about self-impacts of the activities conducted within the scope of the project, most of them stressed their positive impacts on themselves. A school counselor directly articulated as follows:

> "Before the project, the informative activities were conducted less frequently... I mean, up to now, we learned mostly about evacuation and some measures after an emergency occurs. However, we called this damage reduction, referring that there are various measures and actions to be taken before an emergency occurs, which save our lives in the times of an emergency.We were trained mostly by Japanese trainers, which was our difference. For instance, it is difficult to say but I did not know many of these measures and actions before the trainings. I mean, putting bed and coach away from the windows, taking drop-cover hold position during an earthquake..."

A18-year experienced class teacher made an immediate mention of gaining permanent knowledge from the extra-curricular activities conducted within the scope of the project by stating that:

> "I think these activities have positive effects on myself as well as students…This is the first time that we worked hard and in detail about disaster-related issues. That's why I found this project really effective and achieved its main goal. We did really good and beneficial things in the class. We organized rap music contest, we painted the wall, etc. While we were doing these, we had lots of fun. They were both fun and we learned lots of things, definitely permanent."

Impacts of disaster education on lessons.

When the teachers were asked to mention impacts of extra-curricular activities conducted regarding disaster education, all participants claimed that they did not give particular importance to disaster-related issues in their lessons before the project. They implemented these issues whenever and however the curricula allow. The

school counselor, one of the master teachers of the project in the school, described the previous situation as follows:

> "Some topics related to disaster education are involved in certain subjects. Teachers deliver the curricula as intended. However, they had no clue about disaster education, how to implement it, how to make a connection between disaster education and other topics until the project."

In addition, most of the teachers complained about the limitations arising from the strict curricula that they have to deliver them, as they require. An English teacher directly articulated this:

> "Disaster education should be life-long lasting. However, formal school education is not enough by itself. Topics related to disaster education are so limited that students can only acquire some specific knowledge and skills on disaster preparedness...Disaster-related issues are not covered in each grade, especially in English lessons. Only 7th grade curriculum has a unit including those issues. We talked about mostly earthquake and earthquake drills held in the school when we covered that unit. However, we could not spend much time to discuss those issues with other students at different grade level because we have to follow what the curriculum says. "

Another important shortcoming of the elementary curriculum found in the study was that related knowledge and skills could be remembered only for a short time and forgotten easily because the current curriculumis not sufficient for effective disaster education. The classroom teacher reflected her thoughts about the need for curriculum development:

> "We try to conduct all activities included in the textbooks. In the first place, these activities seem to be O.K. and students seem to gain what you teach. But, for instance, there is only one topic covering those issues in the life science course. After a few weeks later, students can easily forget what they learned before. So, as a solution, I think we have to repeat and repeat againin order to provide permanent knowledge. This can happen only if we increase the frequency and the number of the activities related to those issues."

It was revealed that the impacts of the project on teachers' lessons were positive and they applied what they learned from the trainings to their lessons. Therefore, the learning environment was enriched through extra-curricular activities that they developed. This was reflected in what the school counselor stated as

follows:

> "By the means of the project, even our mathematics teacher integrated disaster-related issues into the math lessons within the formal curricula. He developed some activities in order to encourage students' learning about those issues. For example, they calculated the cost of supplies that should be included in an earthquake kit. In this activity, students can learn two important aspects, which are what supplies should be included in an earthquake kit and how much we need to pay for it."

Moreover, it was clear from the interviews that teachers benefitted a lot from the trainings regarding pedagogical and content knowledge. A social studies teacher described how she integrates disaster-related issues into her lessons and how key messages, knowledge and skills are reinforced through extra-curricular activities by saying that:

> "The most important impact was to raise awareness. We realized that we did not know about safety-related measures for any kind of emergency, especially for earthquakes in this region. We learn what to do to be more prepared against disasters…This was also reflected in my lessons. I feel more confident when I teach disaster-related issues because I have not participated in such trainings before. It was revealed what we know and what we do not know about those issues after trainings… Then, I conveyed related information to my students. We conducted lots of activities during the process. For example, we conducted danger hunt with students and we determined the items that can be dangerous during an earthquake. Then, we discussed the protection ways from the negative impacts of earthquakes… My lesson, social studies course, provides a rich learning environment for these topics. For example, there is a topic at the 6th grade level, named as social help and solidarity. We prepared an emergency kit and a first aid kit. Students provided necessary supplies for the earthquake and first aid kit. So, students can embrace a sense of responsibility to protect themselves and people around them from disasters."

Teachers' approaches to disaster education.

Interviewees had wide-ranging interpretations of how they approach to disaster education.The major problems that they encounter were the lack of allocated time and learning materials in order to better promote disaster education. Most of the teachers claimed that they couldn't spend much time for disaster education because of their over loaded working hours. In addition, they complained about not knowing how to implement disaster education effectively because they do not have the

required learning materials on disaster-related issues. The school counselor compared our current situation with a Japanese one regarding disaster education by stating that:

> "If you asked me, disaster education should be implemented under a specialized course curriculum from the first grade through secondary education. It should have its own textbook, and its own learning materials. For example, the Japanese education system has more systematic approach to disaster education. There was an experiment that we conducted in one of the trainings with Japanese trainers. It was about how seismic waves affect buildings. This model costs approximately $ 4,000. They taught us to make similar model with an elastic band and a piece of cotton and it really worked. We need to learn this kind of visual activities to implement more effective disaster education. As a teacher, I realized that we are not well qualified about teaching disaster-related issues yet. Maybe this is because our education background was based on rote-learning."

Moreover, the majority of teachers highlighted a separated course focusing on only disaster-related issues instead of integrating those issues into major courses. The English teacher made an immediate mention of the need of a stand-alone course on disaster education by stating that:

> "In my opinion, there should be a stand-alone course focusing on disaster risk reduction and disaster preparedness. It can be implemented during free activity time. Especially, schools placed in the regions that have high risks for earthquakes should have such education programs."

Then, she described her reasoning of her thoughts about the new approach to disaster education:

> "I think the allocated time to disaster education is not sufficient when it is implemented through infusing it into major courses. Also, there is a lack of teaching materials. So, there can be a rich learning environment if a separated course on disaster risk reduction is established. Apart from that, different kinds of learning activities, not only curricular activities but also extra-curricular activities, can be conducted. We can visit simulation centers, museums, the regions that anearthquake had occurred before, etc. within the scope of the course. Various animations, related videos, etc. can be used as teaching materials."

Structural and non-structural preparedness measures at the school.

The teachers also gave some information about structural and non-

structural preparedness measures taken within the scope of the project. Table 4.16below displays the most frequent coding themes related to structural and non-structural preparedness measures that emerged from the data.

Table 4.16 *The Most Frequently Emerging Codes Related to Structural and Non-Structural Preparedness Measures in the School A*

	Coding Themes
Structural Measures	Fastening bookcases securely to walls Determining assembly areas Moving desks away from windows Preparing a first-aid kit for each class Determining emergency exits
Non-structural Measures	Trainings for parents, teachers and students Providing informative brochures about disaster preparedness and safety-related actions Contacting with local press Revising the school emergency and management plan Evacuation drills

Most of the teachers pointed out the importance of trainings held in the school within the scope of the project for all stakeholders. Among the coding themes, the most frequent non-structural measure was the trainings organized by the master teachers for parents, teachers and students. Informative brochures were prepared and distributed to them. The participation rates of the trainings were satisfactory. However, there were several problems that the master teachers encountered during the trainings, especially the trainings for teachers. One of the master teachers, the school counselor gave some information about these problems and suggested possible solutions for them by saying that:

> "… Our colleagues really work hard and they have to deliver the curriculum as it should be and they do not have much time and effort to spare for this kind of activities. Our trainings for teachers took a long time approximately 2 or 3 hours after the school hours. This means that teachers had to stay 2 or 3 more hours at the school for the trainings. Because they make a lot of effort for their lessons and they also spend a lot of time for them, spending extra three hours in the school became a big issue. Although some of them were reluctant to participate in these trainings, there were some teachers who did not believe disaster education is essential for us and they thought that the trainings were organized based on our initiatives. As a solution for this problem, such trainings should be formalized and these trainings should be mandatory."

On the other hand, the trainings for parents and students rather maintained within more positive environment. The school counselor influenced her positive feelings about the trainings for parents and students by saying that:

> "Parents also were participated in the trainings at the school. The participation rate was satisfied. We distributed brochures to them. The presentation was visual-based, which paid their interests. We also provided some trainings for psychoeducation. After trainings, they started to keep flashlight in their bag to be prepared in case of an earthquake… Home insurance against a disaster was one of the important issues that we emphasized during the trainings. Most of the parents live their own home. Therefore, this really attracted their attention and they promised to have one…Students are encouraged to communicate with their parents about earthquake preparedness and share their learnings with them. Some parents created a family emergency plan and talked about where to meet after an earthquake."

Another important non-structural measure taken within the scope of the project was school emergency and management plan. Each school requires a school emergency and management plan. However, most of the teachers complained about its uselessness. They claimed that before the project, the plan was documented as a requirement and it was not designed in accordance with the school conditions. After the project, the current plan was reorganized in terms of fresh knowledge gained from the trainings and regarding to conditions of the school. Also, each teacher took role in developing the plan and they were more aware of their responsibilities. Therefore, the school plan becomes feasible after the project.

Moreover, interviewees mostly talked about the changes in evacuation

drills after the project. Before the project, an evacuation drill was conducted once a school term and it just happened as is due. The major focus was the frequency of children's participation in the drills. On the other hand, within the project, the number of frequency of evacuation drills was increased. After each drill, teachers assess the content and processes whether students accomplish properly or not.

Furthermore, the teachers examined whether children and school staff are familiar with the appropriate earthquake safety behaviors or not before conducting a drill and clarified what is required of staff and children in case of a real emergency situation. In addition, teachers are separated as groups and each group has its own role in the evacuation drills. Before the drill, the teachers are reminded their responsibilities and discuss about what they are expected for the drill.In addition, there is a reflection session conducted after the drill and in this session, problems that the teachers encounter during the drill are discussed and regarding them the school plan are updated.However, some teachers still thought that students at younger age do not take those drills seriously and behave like as they play a game. One of the studentsshowed the reason of not being interested in disaster-related issues was related to not having any earthquake experience and he madean immediate mention of this situation by stating that:

> "I think there were not any impacts on students. They were not interested in preparing an earthquake kit because most of them have not experienced any types of disaster events yet. They did not much care about disaster-related issues."

When he was asked to suggest some solutions in order to overcome students' careless about disaster-related issues, he continued as follows:

> "In order to draw students' attention to disaster-related issues, disaster education should be implemented by providing more participatory learning environment and it should be visual-based mostly. The frequency of practices should be increased. Also, evacuation drillsshould be conducted based on different scenarios."

Furthermore, some teachers mentioned about using evacuation drills

as an assessment tool of students' learning about disaster-related issues. However, one of the students described her younger sister about what she felt during an evacuation drill by saying that:

> "My little sister is a student at 2nd grade level. There was an unannounced evacuation drill conducted in the last year. My little sister and her classmates were very terrified and they all felt shocked and did not know what to do because it was her first time. She told me that when everyone dropped to the ground and covered under their desks, she did the same thing. She could not stay in calm and made panic but she learned exactly what to do in the times of an earthquake after the drill. When they heard the siren after the earthquake drill, they came into line and move fast to exit the building."

In this case, after her first time, she is more likely to take proper safety actions in the times of an evacuation drill because she emphasized the importance of staying in calm during and after earthquakes and doing what teachers say. Therefore, evacuation drills can be used to monitor the current status of students to themselves. Students also can realize their current status, what they can do, and what they cannot do during the drills so that they can take trainings and disaster education more seriously to improve their skills and knowledge about disaster-related issues. Then, maybe she can be assessed what she learn about safety-related behaviors for earthquakes for the following time.

When the teachers talked about structural measures taken in the school, most of them clarified that every activities and mitigation measureswere conducted with the school's own means. Although some volunteer parents contributed to provide those structural measures, they encountered some financial problems and the school counselor claimed that:

> "Of course, we had some financial problems. For example, we did everything with our own means… But, we do not have enough number of first-aid kit. In fact, we make children prepare earthquake kits. There are some volunteer parents providing some supplies for earthquake kits. Again, our school manager provided financial and technical support for fixing the bookcases to the wall. We determined emergency exits. We do not have much budget for these structural measures but we did our best. We have not fixed the computers securely yet, which will be the next step, or we have not fasten students' desks to the ground. For example, we teach them to drop down to the floor, take cover under a sturdy

> furniture, such as desk and hold on to it. However, it does not make sense when we cannot fasten those desks to the ground and make them be unshakable because students do not feel safe under those desks in the times of an earthquake. But these things take time so we try to do our best at least."

Furthermore, the interviewees had some future plans fordisaster education. Mostly, they areplanning to disseminate disaster education to whole community.It was revealed that disaster education should not be limited within the school, but should break the school boundary and the linkage between disaster education and community should be built through schools. In addition, school is considered as the most suitable place to disseminate disaster education in the community. The most effective way of dissemination of disaster education in the community is considered as the engagement of the media in order to stimulate better disaster resilient culture. The school counselor made some key points about their future plans and stressed on the importance of dissemination activites regarding disaster education by stating that:

> "It is very important to incorporate with community members to promote better disaster risk reduction. We are planning to develop a project out of the school including our neighborhood. Not only parents but also other community members should be aware of disaster risk reduction and preparedness measures. We can use national press to transmit the importance of disaster education to the community members. We used local press, which was really effective for disseminate what we did about disaster education within the scope of the project. When I visited other schools, teachers and parents heard from the local newspaper. This was impressive. At least, they were informed about good practices of disaster education and they were encouraged to implement disaster education. Also, school newspaper can be published."

Moreover, it was revealed that it is essential to incorporate with disaster management specialists from other institutes, and universities to ensure disaster risk reduction but it should be incorporated into not only the schools but also into the education sector as a whole. The English teacher pointed out the importance of strengthening the networks among disaster experts and schools. She stressed the essential of providing easily understandable information on disaster risk reduction by especially disaster experts from the universities. This can encourage people to take action to reduce disaster risks and build more resilient community. She gave an

example from her past and suggested to develop trainings and learning programs in disaster risk reduction targeted at teachers by saying that:

> "…When I was a student, Prof. Oğuz Gündoğdu visited our schools in the year that I experienced a big earthquake. He provided us information about earthquake-related issues at the school. What he taught us sticked in my mind. The fact that Turkey has fault lines near the surface causes the increase in destruction of earthquakes. Disaster experts, such as instructors from universities and research assitants should provide disaster-related information to community members for promoting of better disaster risk reduction.

4.3 Results onTextbook Revision

Objectives related to disaster education were placed under the title of "Afetten Korunma ve Güvenli Yaşam". It is aimed to integrate interdisciplinary objectives into major curricula through teaching process. Objectives for disaster education are mostly associated with life sciences and social studies at primary school level, but with science and technology at elementary school level (Kırıkkaya, Oğuz-Ünver, & Çakın, 2011).

Social sciences course (4^{th}-5^{th}) has one unit including both interdisciplinary objectives and core objectives related to disaster education named as "İnsanlar, Yerler ve Çevreler" which has two subtopics, "Yaşadığımız Yer (4^{th}) and Bölgemizi Tanıyalım (5^{th})". While science and technology course has both interdisciplinary objectives and core objectives corresponding to disaster education at 4^{th}, 7^{th} and 8^{th} grade level, on the other hand, there is no such objectives or activities related to disaster education at 5^{th} and 6^{th} grade level in the course. At 4^{th} grade level science and technology course has one unit and one sub-topic under that unit referred to disaster education named as "Dünya ve Evren / Gezegenimiz Dünya". At 7^{th} grade level there are two units and two subtopics under these units namely "Canlılar ve Hayat / İnsan ve Çevre and Fiziksel Olaylar / Yaşamımızdaki Elektrik". Furthermore, there is one unit and one subtopic under that unit associated with disaster education which is "Dünya ve Evren / Doğal Süreçler" at 8^{th} grade level (MoNE, 2005).

While the aforementioned courses have core objectives in relation to disaster education, Turkish and Mathematics courses are different, where interdisciplinary disaster education objectives were associated with only several activities. For example, the unit of "Zamanı Ölçme" in the mathematics curriculum at 4th grade level has an objective as the fact that students should be able to explain the relationship between a minute and a second. There are two interdisciplinary disaster education objectives associated with that objective the first one of which is defined that students should be able to compare earthquake duration and the second one of which focuses on that students should be able to recognize that how long an earthquake takes time on average. In the case of Turkish curriculum, the core objective about reading and listening skills for gaining information is interrelated with the interdisciplinary objective about making research on hazards that can be faced in case of an emergency (MoNE, 2005). Intended learning outcomes of each unit within different subjects on disaster education are summarized in the Appendix C.

As a result of a detailed review of textbooks, it was found that the disaster-related terminology in the textbooks is not aligned with international terminology. In the textbooks, disaster is defined as *"destruction induced by natural events"*, which is very surficial and not coherence with broader disaster definition created by UN/ISDR

> *"a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources*"

Moreover, while the definition in the textbooks do not provide any disaster risk reduction concepts, such as risk, risk assessment, hazard, vulnerability, and capacity building, the UN/ISDR definitionemphasizes the idea that this serious disruption occurs, when the coping resources, skills and abilities of a society or a community are insufficient to response to and recover from its negative impacts and loses.

Furthermore, as a result of the revision, it was revealed that they fail to cultivate pre- and post- disaster basic readiness and response skills. They mostly address earthquake protection and preparedness, because earthquakes are one of the most frequent natural hazards in the region, but still strengthening buildings as one of the most essential pre-disaster readiness measures against earthquakes is insufficiently discussed. As an example, fastening furniture, which is just one of important actions for eliminating damages caused by earthquakes, is highlighted at best. However, the other essentials such as relocating furniture, keeping evacuation routes clear, refraining from acquiring large and heavy objects, etc. are underemphasized. Furthermore, drop-hold-cover position that is the basic response during an earthquake is the mostly emphasized in the texts. More than that, they have lack of information about preparedness measures and response acts for other types of disasters occurred in Turkey, such as flood, fires, landslides, etc.

Finally, textbooks convey mostly the message of devastating results of disasters, do not mention the basic idea that disasters can be prevented, or at least we can mitigate their adverse impacts through some arrangements in our life.

4.4 Summary of the Results

In this section, the results obtained from data collection instruments were analyzed and reported in a way that results were categorized into two main parts. The first part was related to the results on students' knowledge about disaster-related issues and disaster education taken place in their schools and the other one included the results on impacts of disaster education activities within the scope of the project on both teacher themselves and their lessons, teachers' approaches to disaster education, and structural and non-structural measures taken to be more prepared against disasters in the school.

This report presents a preliminary of the summary of the results obtained within the scope of the present study. Key findings of the study indicate that while students from School A were more successful to explain the physical mechanism of

the occurrence of earthquake, more students from School B had some nonscientific beliefs about occurrence of natural events and claimed that God creates natural eventsfor punishment of people's sin. In relation to this result, more students from School A claimed that natural disasters are things that can happen at anytime and there is not a warning before an impending disaster. However, students from School B believed that they couldn't do many things about natural hazards. This belief was linked to feelings of lack of control over disasters and this was reflected by more students from School B in saying that, "natural hazards are act of God", "natural hazards are supernatural events", etc.

Furthermore, students from School A had higher perceived level of risks than student from School B. Earthquakes were perceived as the greatest risk for them. They were more aware of potential impacts of earthquakes, and this was reflected through making more earthquake-specific preparations rather than preparations for the other types of disasters. Therefore, students from School A linked the occurrence of disasters to the not being prepared enough. Therefore, they believed that when we are prepared against disaster events as much as possible, they could mitigate their possible adverse impacts.

In general, students from School A reported that both curricular and extra-curricular activities were conducted at more sufficient level. In regarding this, more students from School A were encouraged to share what they learnt about disaster-related issues with their friend and they were encouraged to discuss those issues at home, and most of the students from School A feel more responsible to protect themselves from disaster events and they feel more confident about taking preparedness actions and vital safety-related behaviors. Therefore, while students from School A reported that they would take some form of protective response for earthquakes, and they had intention to take mitigation and preparedness measures for disaster events, students from School B reported that they would find their parents or teachers without taking any form of safety-related behaviors in the times of an earthquake, and had less intention to take certain measures to overcome the adverse consequences of disaster events. As a result, while students from School B reported more correct response actions for disaster events, students from School B reported some erroneous response actions for earthquakes (e.g., staying inside of the building

after the shaking stops, moving top of the building during the quake, etc.). However, most of the students from both schools did not feel safe enough, particularly, when they were at the school. They believed that their school buildings were not made of good building materials.

In addition, while students from School A preferred active role (whistling for being noticed by emergency response team) when they were under the debris as a result of an earthquake, students from School B preferred more passive role and waiting to be rescued under the debris.

In the light of the results obtained from the teachers, it was revealed that the elementary program was not enough for promoting better disaster education.The teachers complained about lack of teaching materials and they did not feel themselves confident while they taught disaster-related issues due to lack of content and pedagogical knowledge that they have. However, it was provided rich learning environment with renewed disaster education approach so that disaster education was implemented more effectively, both students and teachers learnt many things related to disaster preparedness and mitigation measures from the trainings and the activities conducted in the school, and the information about disaster-related issues through participatory activities was more permanent. Moreover, the teachers suggested that disaster education should be covered under a specialized course having own curriculum, teaching materials, textbooks, etc. As a result, it was found that there is an urgent need for teacher training to ensure well-qualified teachers regarding disaster-related issues and disaster education. They paid attention to the essential of incorporation between schools and universities or other related instituties for better disaster education.

Moreover, to promote better disaster risk reduction, the teachers stressed on the importance of including of family and other community members in disaster education. It is important to note that disaster education should not be an event, but should be a continuous process and life-long lasting. Furthermore, disaster education should be linked to the community and family.

CHAPTER 5

CONCLUSIONS AND IMPLICATIONS

This chapter presents the conclusions of the present study and their implications for further studies and for practice.

This research was aimed to compare two schools regarding two different approaches to disaster education. One of the schools, School B, uses only curricular activities and the other school, School A, uses both curricular and extra-curricular activities focused on disaster risk reduction. The data were collected through an open-ended questionnaire for students from both schools, interviews with six teachers and three students, and observations and field notes conducted by the researcher. The data obtained from student questionnaire and interviews with teachers and students were thematically analyzed, coding themes were identified, and findings were elicited on the wide-ranging of hazard beliefs that students hold, students' knowledge about correct form of disaster response behaviors, and preparedness measures to be taken, different forms of teaching activities on disaster education taken place in the schools that teachers approached to, impacts of disaster education on students, teachers and home-based preparedness, teaching barriers for disaster education that teachers encountered, and finally, possible solutions and suggestions for those problems.

5.1 Conclusions

From the overall results of the questionnaire, some significant conclusions can be made. Students who participated in both curricular and extra-curricular activities on disaster risk reduction showed higher awareness about taking preparedness and mitigation actions, and about sharing related information with people around them. Also, vital safety behaviors for disaster events, particularly for earthquakes were well known by those students. Therefore, it can be said that formal disaster education with

supplemental extra-curricular activities enhances awareness about disaster-related issues and increases the understanding of hazard types and their impacts on themselves, on people around them, and the environment that they live, and improves household preparedness. It has been found in previous research studies that disaster education through various formal and informal education means promotes awareness about disaster-related issues, to respond properly when a disaster occurs, to recover its damages after it strikes, and children's interactions with their parents so that it increases home-based preparedness(Finnis, Standring, Johnston, & Ronan, 2004; Hosseini & Izadkhah, 2006; Ozmen, 2006; Ronan & Johnston 2001, 2003; Shaw, Shiwaku, Kobayashi, & Kobayashi, 2004; Shiwaku, Shaw, Kandel, Shrestha, & Dixit, 2007; Shiwaku & Shaw, 2008; Shiwaku & Rajip, 2008; Tanaka, 2005). These results can be explained by having more realistic risk perceptions and more knowledge about disaster-related issues. Evidence suggests that if people see the fortcoming disaster event as a risk to their life, properties, etc., they are more likely to undertake self-protective actions to be more prepared against its possible adverse consequences (Mishra & Suar, 2007; Slovic, Fischhoff, & Lichtenstein, 1981). The impact of disaster-related education on risk perception and on disaster preparedness have been found and reviewed by several researchers (Mishra & Suar, 2007; Ronan, et al., 2000) and it was revealed that people having more disaster education were more prepared for disaster events and they perceived more risk to them.

In addition, most of the students from both schools reported earthquakes were the most frequent disaster event that is more likely to occur in the region. This indicates that students knew well the environment that they live. Most of the students from both schools perceived earthquakes as significantly more likely to occur so there is no significant difference between those students. This also can be explained by their risk perceptions influenced by their previous disaster experiences. The Marmara region is the one of the earthquake prone regions in Turkey. Thus, students were aware of the possible risks of future earthquakes as a result of their own previous experiences or victim people around them that experienced an earthquake. As pointed out by Mishra and Suar (2007) personal experience leads people to think about the risk of the impeding disaster more often and facilitates preparedness behavior against it.

Moreover, while students who participated in only curricular activities referred disaster events as natural events such as earthquakes, flood, etc. and neglected man-made disaster events such as fires, chemical attacks, terrorism, etc., students who participated in both curricular and extra-curricular disaster education activities paid more attention to man-made disaster events. The underlying reason can be related to lack of information about man-made disaster events in the elementary curriculum. Therefore, students can be misleaded by limited teaching resources about man-made disasters.

Furthermore, it was revealed that students form both schools mostly focused on the physical destruction and loss of lives caused by disaster events. The results of this study are consisted with what Turan and Kartal (2012) found in their study on the natural hazard concept was defined as the natural event that causes physical destruction and injuries or deaths. In the literature, there is a research study conducted by Kaya (2010) aimed to reveal the perceptions of secondary students about earthquake concept. In this study, the results indicated that the metaphors that were produced by the students about "earthquake" concept were directly or indirectly linked to the students of bad experiences they had either lived or heard from the media. Therefore, the reason for that the students conceived earthquakes as destructive events can be explained by students' own previous experiences about earthquake or what they heard from the media, so that they would affect students to perceive the earthquake conceptin a negative way.

Another important aspect of students' understanding of the impacts of earthquakes found in the present study was that earthquakes also cause some psychological damages. This result indicates that even if most of the students have not experienced a devastating earthquake yet, they heard it from media or earthquake victims that people around them. This results in some emotional burnouts in their inner world. There are a good number of studies that support this finding. As in the study of Aydın and Çoşkun (2010), some students defined the earthquake as "death", "an event that corrupts human psychology" and "destruction", which is consisted with the findings of the present study. In addition, in the present study, several students reported that people who experienced a devastating earthquake should take a good lesson. Similarly, in the study of Kaya (2010), some students perceived the

earthquake as a prudent event and reported that earthquake victims should learn from their past experiences and take a good lesson from it, which is also consisted with this result of the present study.

Moreover, almost all students from both schools reported that house building structure should be made of good and solid building materials as one of the essential preparedness structural measures for earthquake risk reduction and some students mostly from School B found disaster education as meaningless if building structure is not good enough. Those students gave more importance to structural strethening of buildings for disaster risk reduction than disaster education. The underlying reason can be related to that School B does not stress on disaster education intensely and those students did not realize the importance of disaster preparedness as an essential aspect of disaster risk reduction. Thus, these students are not aware of that even if the building structure is solid and good, when people do not take proper safety-related response and preparedness actions, they are still likely to get injured caused by falling heavy objects down as a result of an earthquake.

Furthermore, it is clear from the questionnaire that students held various hazard beliefs, they were consisted with previous studies that salient beliefs about hazards and their influences on adjustment adoption for hazard preparedness (Becker, Paton, Johnston, & Ronan, 2013; Whitney, Lindell, & Nguyen, 2004). It was found in this study some hazard beliefs that motivate people to be prepared against disaster events, such as that believing in there is a risk, and that there is not warning time or the occurrence of disaster events could not be forecast, and other hazard beliefs that discouragedisaster preparedness found in this study, such as that believing in one cannot do anything about disaster events, and that natural hazards are act of God for punishment of people's sin. Students who participated in disaster education through various types of extra-curricular activities as well as curricular activites held such hazard beliefs that encourage hazard preparedness and students who participated in only curricular activities focusing on disaster education held such beliefs that discourage hazard preparedness. Therefore, it can be inferred that formal disaster education with supplemental extra-curricular activities enhances hazard beliefs that are helpful to motivate hazard preparedness and decreases the inflcuences of hazard beliefs that are unhelpful to motivate hazard preparedness.

Furthermore, earthquake preparedness family plans, family evacuation practices, preparing a contact card, and determining assembly areas were reported to be poorly adopted by the students who participated in only curricular activities on disaster education. Preparing first aid kit, learning first aid, and picking an emergency contact person outside of the region as the principal earthquake preparedness measures reported to have been adopted by the most of the students from School A, and less students from School B reported those preparedness measures to be poorly adopted for their households. The underlying reason of this can be related to that those preparedness measures were emphasized as essentials of disaster risk reduction through various types of extra-curricular activities conducted in the School A.Another important point was that even if students from both schools have not undertaken aforementioned preparedness measures yet, more students from School A reported that they had intention to take those actions than students from B did. According to Hines, Hungerford, and Tomera (1987), an individual expressing an intention to take an action will be more likely to engage in the action than another individual expressing no such intention. Also, they continued that before taking action intentionally, knowing about that issue is a prerequisite to that action. Therefore, it can be inferred that formal education through only curricular activities on disaster-related issues more focused on traditional earthquake preparedness actions (e.g., securing items, collecting supplies for earthquake kit, etc.) and do not require enough knowledge about aforementioned earthquake preparedness measures; thus, students do not have such intention to take not only tradiotional but also other proper actions to be more prepared against earthquake.

In addition, most of the students from School Ahad higher awareness of vital safety behaviors for disaster events, especially for earthquakes. It can be concluded that the students who participated in both curricular and extra-curricular education programs have preparedness plans, practices and measures, and have better knowledge of safety behaviors for earthquakes. The main reason for these results can be related to that formal disaster education has some deficiencies in enable students to take required earthquake preparedness actions for their households, and to take safety-related actions for earthquakes. These deficiencies were overcomed through supplemental activities. For instance, these results are consistent with the results

found in the study conducted by Johnston, Ronan, Finnis, Leonard and Forsyth (2011) aimed to assess children's level of awareness, risk perceptions, factual knowledge, and physical preparedness for hazards.It was found that most of the children who participated in a hazard education program at their schools knew correct actions to take in the face of a disaster and a series of preparedness measures and reported that they had done the right thing during the earthquake occurred in 2003, in Australia. As pointed out by Hines et al. (1987), there are two critical components of taking proper actions. The first one is acquiring knowledge of which actions are available and the most effective in a given situation. After chosing the available action strategy, the individual should possess skills for applying this strategy to that given situation. In that sense, in order to lead students to take proper actions for any kind of emergencies, it is not enough to raise awareness about disaster-related issues. They should be given such learning opportunities that enable them to acquire required skills. It is crystal clear that only curricular activities do not meet this need and there should be some supplemental activities to be conducted, such as emergency practices like in School A. Although schools are required to have school emergency plan and to conduct regular emergency practices, it seems that emergency practices conducted in School Bfail to achieve the goal that is to show the ability of students to cope with disasters as revealed from the data in the present study.

Moreover, there was a significant difference between students who involved in both curricular and extra-curricular activities in relation to disaster education and students who involved in only curricular activities in terms of their reports of home-based earthquakeadjustments. More students from School A have adopted home-based preparedness measures (e.g. family emergency plan, earthquake kit, first-aid kit, securing items, etc.) than students from School B have adopted such measures for their households. This can be because students were encouraged to share information about earthquake preparedness with their parents through extra-curricular activities and the required information about earthquake preparedness was transmitted to parents via students. Therefore, it can be inferred that increasing the link between children and their parents can increase preparedness at home. Another underlying reason for this result can be related to the trainings for parents organized

in the school. Parents were also informed about home-based preparedness adjustments through those trainings and they also were encouraged to undertake those adjustments. These results are consisted with the results found in the study carried out by Ronan and Johnston (2003). The findings of this study supported the idea of an interactive perspective and showed that increasing the interaction between students and parents through disaster education leads to increase the number of disaster adjustments so that it increases readiness at home against disasters.

A majority of students who participated in formal disaster education with supplemental extra-curricular activities feel themselves responsible to protect themselves from disasters, and feel themselves sufficient about disaster preparedness, response and recovery issues. This result presents that formal disaster education with complemantary extra-curricular activities promotes students to feel responsible to take required actions to reduce disaster risks and feel confident about disaster preparedness, response and recovery measures.These results can be explained through results found in the study conducted by Ronan and Johnston (2001, 2003). They examinedthe relationship between physical and emotional coping strategies with stress and disaster education programs. In their study, pyhsical coping resources include factual knowledge in relation to preparedness and response behaviors and emotional coping resources include reducing hazard fears and increasing confident about available coping resources. The results displayed that there was a relationship between coping startegies each other and as well as between coping strategies and disaster education programs including emergency-management focused teaching through extra-curricular activities with interaction with students and their parents. They found that students having unrealistic risk perception had more hazard-related fears and lower levels of confidence in their ability to cope with a future hazard comparing to students with more realistic risk perception.

In addition, they also stated that the fearful group of students showed lower level of knowledge about emergency response compared to less fearful ones. Therefore, the findings of the present study supported the role of disaster education in increasing hazard-based knowledge level and confidence level in engaging in risk reduction activities, reducing fear level, and enabling students to demonstrate more realistic risk perception.

While most of the students from School A searched on the Internet in order to gain more information about disaster-related issues, a majority of students from School B communicated with their family members and gained further information through TV and newspapers. According to the study conducted by Shaw, Shiwaku, Kobayashi and Kobayashi (2004) aimed at understanding of the impact of earthquake experience and education on awareness, self-education focusing on education through self initiatives through participation in public lectures, searching the Internet, reading books, visiting disaster management facilities, etc. has a higher contribution for perception and deepening of earthquake awareness. On the other hand, it can also lead to some misunderstanding about those issues. Therefore, as Aydın and Çoşkun (2010) pointed out that students bring to the classes with some concepts about disaster-related issues that are not scientific, gained through their own experiences on TV, the Internet, news and documentaries earlier. Therefore, teachers should take into considerations those misunderstanding of students while teaching these issues and develop some teaching activities or materials to determine those misconceptions that students held and to promote more scientific learnings about disaster-related issues.

Furthermore, it was revealed that teachers felt more confident in terms of content and pedagogical knowledge on disaster education after they gained several trainings on disaster risk reduction. This major reason for this situation can be that teachers are more likely not to have sufficient knowledge about disaster-related issues and teaching methods for effective disaster education, and most of them did not participate in such trainings in order to improve themselves about these issues through either pre-service education or in-service education. The findings of the study by Kırıkkaya, Ünver, & Çakın (2011) were parallel with what have been found in the present study.In that sense, it was revealed that there is an urgent need for developing the pre-service teaching programs and in-service trainings focusing on disaster education in order to improve themselves in terms of both related content and pedagogical knowledge.

In addition, the teachers complained about the lack of teaching materials and activities for disaster education in the current formal curricula. They reported that they learnt how to develop more participatory teaching activities within the scope of

the project, and this resulted in promoting better disaster education with a rich learning environment and students were more interested in participating in those extra-curricula activities and being a part of disaster risk reduction measures. This result shows the need for developing teaching materials and activities on disaster education. These results are similar to the findings of the study conducted by Öcal for the purpose of investigating the current status of teaching earthquake-related education in social studies courses at elementary level (2005). He found out that teachers had some difficulties about using teaching materials about disaster-related issues, particularly technology-based due to lack of such materials, financial problems and lack of pedagogical knowledge about using them. It can be inferred that educational faculties fail to provide required knowledge and skills for pre-service teachers' preparations of using such teaching materials in relation to disaster-related issues.

Moreover, the results of the data obtained from the interviews with teachers again showed that some major structural and non-structural preparedness and mitigation measures (e.g., securing heavy items, having emergency and first-aid kit, revising the school emergency and management plan, determining emergency exits, increasing the frequency and the quality of evacuation drilss, etc.) were undertaken within the scope of the disaster risk reduction. These improvements can be expounded as the indicator of the gaining more importance to reduce disaster risks afterdisaster education programs. Therefore, it can be inferred that formal disaster education with extra-curricular activities plays a vital role in increasing teachers and students being ready, willing, and able to do what is necessary to prepare for and respond to an emergency.

5.2 Implications for Practice

Taken together, the findings of the study support the role of disaster education through extra-curricular activities in increasing resilience in children and at home.They demonstrated the advantages of extra-curricular activities in relation to disaster education for the purpose of increasing disasters-based knowledge, and adopting protective disaster preparedness, response and recovery measures.

Therefore, this study provides the first experimental evidence of greater benefits of such extra-curricular activities to not only children and teachers but also their parents. Moreover, compared to disaster education only curricular activities, an intense disaster education program enriched with supplemental activities and materials was seen to produce significant effects in the area of emotion-focused coping resources of children (i.e. feeling responsible and confident about managing an impeding disaster more effectively), for instance, they felt more comfortable about thinking and talking about disaster-related issues.

Furthermore, it is obvious that disaster risk reduction demand active engagement and practical application through helping students and teachers to help themselves and their communities. The overall aims of the trainings to make disaster education is interesting and relevant for both teachers and students. As a result, teachers and students were trained by local and Japanese disaster management specialists, and this attracted more trainees to attend trainings so that they had obvious improvements after the trainings.

All in all, these results provide the policy makers with keystones of successful disaster education program as well as curriculum developers and teachers as practitioners. In this respect, following such approach for disaster education with supplemental activities can assist in improving the disaster-related component of national education in Turkey. However, this study examined the effectiveness of disaster education through both curricular and extra-curricular activities on immediate outcomes such as awareness, personal preparedness, communication with parents, etc. Since earthquakes' occurences cannot be predicted, the only way to reduce their adverse impacts is to be prepared. However, its infrequent occurrence leads people to give less priority of its preparedness (Shaw, et al., 2004). Therefore, the sustainability of earthquake preparedness is still questionable. There should be on-going studies will assist in providing some indication of the long term effectiveness of such programs.

To continue with, although the major goal of disaster education is to change people behavior by presenting information about disaster-related issues, it seems a long and challenging journey to make people behave properly in order to increase their protection against disasters (Nathe, 2000). Thus, disaster education needs to

start in early education through secondary education to increase the chances for galvanizing of protective behaviors and it can continue with various public education campaings for life long learning (Ronan, & Johnston, 2001, 2003). Although this present study was limited to elementary education, disaster education programs at different learning settings also can deliver helpful information about disaster preparedness to other people since the study demonstrates the crucial points of disaster education.

The present study made efforts to investigate the consequences of a coordinated efforts of schools, the Ministry of National Education and JICA with the aim of educating students, teachers and parents about disaster-related issues and mitigation strategies. As a result, it can be concluded that there have been some successes of these efforts in teaching people about disasters and motivating them to reduce their potential losses by taking protective measures. The major point here is that disaster education should attempt to raise people's awareness about disasters, their risks and the protective actions for each possible emergency with the special help of related governmental and non-governmental organizations. Only formal curriculum does not seem to enough to make people to take proper action to increase their own safety. It requires the process that various resources such as scientists, experts, the government, etc. actively involve in.

5.3 Implications for Further Research

The results of the study propose the following recommendations for further research:

1. Another study can be conducted to plan and design a disaster education curriculum that enables students to learn disaster management actively, makes disaster management a part of student's life, promotes the culture of disaster preparedness in the long term.
2. The present study evaluated the situation in a descriptive way. A further study can be conducted to explore teachers' perceptions toward disaster education and their domain knowledge of and attitudes toward disaster education in a broader view.

3. Developing instructional modules and materials for different levels of schools anchored in the curriculum guidelines and content for disaster education could be another research issue.
4. There could be a study that focuses on designing effective evaluation tools to assess students' knowledge about, attitudes toward disaster-related concepts, and skills on disaster preparedness and taking safety-related actions.
5. There could be an empirical studyto be conducted aimed to assess the effectiveness of exemplary teaching materials and evaluation tools on students' understanding about disaster-related issues, their awareness, their willingness to take proper preparedness actions.
6. The present study assessed the current status of school disaster education in elementary level through comparing an alternative form of disaster education based on more participatory learning approach. A further study can be conducted to assess the perceptions of pre-service teachers about disaster education and their competency levels for teaching disaster-related issues.
7. Reforming of pre-service teacher program in terms of content and pedagogical knowledge about teaching disaster-related issues could be another study.
8. The present study revealed an urgent need to organize professional development workshops or seminars for in-service teachers to improve their content and pedagogical knowledge for teaching disaster-related issues. There can be a further study to develop such trainings or workshops for in-service teachers from all over the country and to assess their effectiveness.

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APPENDICES

APPENDIX A

MULTIPLE INTELLIGENCES APPLIED TO DISASTER EDUCATION IN LINE WITH BLOOM'S TAXONOMY

Bloom's Taxonomy / Multiple Intelligences	**Remembering**	**Understanding**	**Applying**	**Analyzing**	**Evaluating**	**Creating**
Word (Linguistic)	List disasters that have affected your community in recent years.	Write a play how people are affected by disasters			Assess your home evacuation plan	Create a new school evacuation plan
Logical-Mathematical	Make a timeline of Turkish disasters			Construct a graph that educates people about flood with data about floods in recent years.	Create a school map that shows the potential sources of risk/hazards to the school.	
Musical-Rhythmic			Write a rap song that helps people what to do in an emergency.	Write a jingle to sell a household emergency kit		Write a song that describes how people might feel after a disaster
Bodily-Kinaesthetic		Demonstrate appropriate action in case of an earthquake	Organize a school evacuation drill with different scenarios.	Perform a play about how to prepare for a particular disaster.		
Picture-Spatial		Make a cartoon strip showing people how to respond to a particular disaster.	Make a model of a particular disaster.	Map hazards that can occur around the school area.		Create diagrams of a new product that will assist in preventing disasters
Naturalistic	List ways in which humans contribute to natural disasters	Find some real-life stories that mention disasters.	Make a game to teach people about earthquake preparedness			Develop a plan to rescue an endangered animal from a hazard.
Self-Intrapersonal		Describe what you do in a flood situation			Make a brochure about what you think are the main 'rules' for surviving a particular disaster.	
People-Interpersonal	Tell your family about an hazard occurred in your region v			Interview people about their disaster experiences.		
Existential-Moral		Describe why disaster risk reduction education is a human right		Explore how different religions view disaster.		

Adapted based on Australian Emergency Management Institute (2012). Retrieved from http://schools.aemi.edu.au/node/123

APPENDIX B

TAXONOMY OF LEARNING OUTCOMES OF DISASTER EDUCATION

Categorize	Subheadings	Example of generic outcome
Knowledge / Understanding	Knowledge of self and others	Learners understand their personal roles and responsibilities in times of hazards and disasters
	Knowledge of hazard and disasters	Learners know of the causes and effects of various hazard and disasters, such as earthquakes, floods, landslides, tsunamis, etc.
	Understanding of key disaster risk reduction concepts and practices	Learners understands key disaster risk reduction concepts (e.g. hazard, disaster, emergency, risk, vulnerability, and resilience), their application to specific hazard circumstances, and their concrete applications in the local community.
	Knowledge of basic safety measures	Learners know precautionary, safety and self-protection measures to be taken before, during and after a disaster by their family, at community level and at school
	Knowledge of disaster management mechanism and practices	Learners know of local, regional, national and international mechanisms and infrastructures
	Knowledge of environment and of the environmental / human society interrelationship	Learners understand the idea of an ecosystem, how human actors within ecosystems are, and that the reverberations of environmentally unfriendly behaviors will work through the system to harm human.
	Knowledge of climate change	Learners understand that climate change is generally human induced and they can identify patterns of behavior, practices and lifestyles that are causing the climate to change.
	Knowledge of differential and disproportionate impacts of hazards on people	Learners understand that disasters have differential impacts according to gender and socio-cultural status.
	Knowledge of the conflict/disaster risk reduction interface	Learners understand that personal or direct violence and structural or indirect violence can both cause and exacerbate disasters.
	Knowledge of human rights/child rights aspects of disasters	Learners know of internationally agreed upon human and child rights and their implications for and applications in disaster scenarios.
Skills	Skills of information management	Learners have the ability to gather, receive, express and present information on disaster risk reduction.
	Skills of discernment and critical	Learners have the ability to discern

	thinking	and interpret signs and signals of impending hazard.
	Skills of coping, self-protection, self-management	Learners have the skills required to collaboratively undertake hazard mapping and vulnerability assessment exercises.
	Skills of communication and interpersonal interaction	Learners have the ability to communicate what they have learnt about hazards and disasters to families and members of the community.
	Skills of affect (responding to/with emotion)	Learners have the ability listen to, receive and empathize with the emotions felt and expresses by others.
	Skills of action	Learners have the necessary skills to be able to assist victims and the vulnerable in case of disaster (e.g. first aid skills, rescue skills).
	Systematic skills	Learners have the ability to identify patterns, commonalities and relationships between different hazards and risks as well as different prevention and response mechanisms.
Attitudes / Dispositions	Altruism/valuing	Learners recognize the intrinsic value of nature and wish to help protect their natural environment.
	Respect	Learners respect the rights of others in their concern for disaster risk reduction.
	Compassion, care and empathy	Learners approach disaster risk reduction from an ethic of caring for future generations.
	Confidence and caution	Learners feel confident, empowered and resilient enough to cope with disasters.
	Responsibility	Learners embrace a sense of responsibility to help protect themselves, their peers, their family and community from hazards and disasters
	Commitment to fairness, justice and solidarity	Learners commit to fairness and justice as the basis on which relationships between individuals, groups and societies should be organized.
	Harmony with the environment	Learners embrace an ethic of care, kindness and respectfulness towards living things.

Retrieved from Disaster Risk Reduction in School Curricula: Case Studies from Thirty Countries, Selby, D. & Kawaga, F., (2012).

APPENDIX C

DISASTER EDUCATION OBJECTIVES INTEGRATED INTO TURKISH ELEMENTARY SCHOOL CURRICULA

SINIF	DERS	ÖĞRENME ALANI / ÜNİTE	DERS KAZANIMLARI	AFETTEN KORUNMA VE GÜVENLİ YAŞAM KAZANIMLARI	UYARILAR
4	**Sosyal Bilgiler**	**İnsanlar, Yerler ve Çevreler: Yaşadığımız Yer**	8. Doğal afetler karşısında hazırlıklı olur.	1. İnsanların hayatlarını sürdürebilmek için neye ihtiyaç duyduklarını fark eder. 2. Deprem anında gerekli ve gereksiz olan malzemeleri ayırt eder. 3. Deprem sonrasında gerekli olan malzemeler hakkında fikir edinir. 4. Çeşitli mekânlarda acil bir durumda gerekli olacak ve kullanılabilecek malzemeleri listeler. 5. Sınıf tahliye çantası oluşturulması ve malzemelerin sağlanması konusunda aktif görev alır. 6. Posterler hazırlayarak toplumun bu konuda bilgilenmesine destek verir. 10. Farklı mekânlarda bir deprem sırasında yapılması gerekenleri tartışır. 11. Deprem sırasında yapılması gerekenleri, deprem tatbikatında uygular. 12. Artçı depremlerde de deprem sırasında yapılması gerekenleri uygular. 13. Bir deprem sonrasında binadan tahliye yollarını bilir. 14. Binanın tahliyesi sırasında karşılaşabilecekleri tehlikelerin farkına varır. 15. Binanın tahliyesi sırasında karşılaşabilecekleri tehlikelere ilişkin yapabileceklerini açıklar.	
5		**İnsanlar, Yerler ve Çevreler: Bölgemizi Tanıyalım**	5. Yaşadığı bölgede görülen bir afet ile bölgenin coğrafi özelliklerini ilişkilendirir. 6. Kültürümüzün sözlü ve yazılı öğelerinden yola çıkarak, doğal afetlerin toplum hayatı üzerine etkilerini örneklendirir.		Yaşadığı bölge ile coğrafi bölge kastedilmektedir. Sözlü ve yazılı kültür öğeleri olarak türkü, şarkı, mani, masal vb. verilecek. (6. Kazanım) Yaşanılan bölgede sıkça görülen bir afet seçilecektir. (5., 6., ve 7. Kazanım) Deprem haftası ile ilişkilendirilecektir. (5., 6., ve 7.

					Kazanım)
			7. Yaşadığı bölgede görülen doğal afetlere neden olan uygulamaları fark eder.	5. Sınıf tahliye çantası oluşturulması ve malzemelerin sağlanması konusunda aktif görev alır. 6. Posterler hazırlayarak toplumun bu konuda bilgilenmesine destek verir. 10. Farklı mekânlarda bir deprem sırasında yapılması gerekenleri tartışır. 11. Deprem sırasında yapılması gerekenleri, deprem tatbikatında uygular.	
6		**Küresel Bağlantılar / Ülkemiz ve Dünya**	4. Ülkemizin diğer ülkelerle ve çevre sorunlarında dayanışma ve işbirliği içinde olmasının önemini fark eder.		
4	**Fen ve Teknoloji**	**Dünya ve Evren / Gezegenimiz Dünya**	2.8. Erozyonla toprak kaybı arasında ilişki kurar (BSB-23).	17. Afetin olumsuz etkilerini azaltmak için neler yapılabileceğini açıklar.	2.8. Kazanımı için Sosyal Bilgiler dersi "Yaşadığımız Yer" ünitesi (Kazanım).
6		**Dünya ve Evren / Yer Kabuğu Nelerden Oluşur?**	3.3. Erozyona etki eden faktörleri deneyerek test eder (BSB-11-20). 3.4. Erozyonun gelecekte oluşturabileceği zararlar hakkında tahminlerde bulunur (BSB-8, 9; FTTÇ-21, 24, 25, 27). 3.5. Toprakları erozyondan korumak için bireysel ve iş birliğine dayalı çözüm önerileri sunar (BSB-25-32; FTTÇ-5, 21, 22, 23, 24, 27; TD-4).		3.3. Erozyonla ilgili olarak 4. sınıfta öğrenilenler hatırlatılır. 3.5. ağaçlandırmanın erozyonu önlemedeki önemi vurgulanır. 3.5. kazanımı, Sosyal Bilgiler "Üretim, Dağıtım, Tüketim" öğrenme alanı, "Ülkemizin Kaynakları" ünitesi kazanım 4 ile ilişkilendirilir. 4. Doğal kaynakların bilinçsizce tüketilmesinin insan yaşamına etkilerini tartışır.
7		**Canlılar ve Hayat/İnsan ve Çevre**	1.6. Ülkemizdeki çevre sorunları hakkında bilgi toplar, sunar ve sonuçlarını tartışır. 1.7. Ülkemizdeki çevre sorunlarına yönelik işbirliğine dayalı çözümler önerir. 1.8. Çevresinde bulunan bitki ve hayvanlara sevgiyle dayanır. 1.9. Ülkemizdeki ve dünyadaki çevre sorunlarından bir tanesi hakkında bilgi toplar, sunar ve sonuçlarını tartışır. 1.10. Dünyadaki bir çevre probleminin ülkemizi nasıl etkileyebileceğine ilişkin çıkarımlarda bulunur.	1. Orman yangınlarının çıkış nedenlerini açıklar. 2. Orman yangınlarını önlemek için yapılan çalışmalara katılmaya istekli olur. 3. İhmal ve dikkatsizlikten kaynaklanan orman yangınlarının çıkış nedenlerini örneklendirir. 4. Orman yangını olduğunda yapabileceklerini listeler. 8. Çığ tehlikesine karşı alınabilecek önlemleri sıralar. 10. Selden korunmak için yapabileceklerini belirtir. 11. Sel sırasında yapılması gerekenleri örneklerle açıklar. 12. Sel sonrasında oluşabilecek tehlikelere karşı	

			1.11. Ülkemizdeki ve dünyadaki çevre sorunlarına yönelik iş birliğine dayalı çözümler önerir ve faaliyetlere katılır.	alınabilecek önlemlere örnekler sunar. 13. Heyelan oluşumunun nedenlerini sorgular. 14. Heyelan belirtilerini sıralar. 15. Heyelan sırasında kapalı ve açık alanda yapılması gerekenleri, nedenleriyle açıklar. 16. Heyelan sonrasında yapılması gerekenleri açıklar.	
		Fiziksel Olaylar/Yaşamımızda Elektrik	1.12. Elektriklenmenin teknolojideki ve bazı doğa olaylarındaki uygulamaları hakkında örnekler vererek tartışır (FTTÇ-5).	(1.12-9) 9. Yıldırımdan korunma yollarını sıralar.	
8		**Dünya ve Evren/Doğal Süreçler**	2.8. Volkanların ve depremlerin insan hayatındaki etkileri ve sebep olabileceği olumsuz sonuçları ifade eder.	17. Tehlike kavramının deprem ile bağlantısını açıklar. 18. Binaların nasıl ayakta durduğunu bedenleri ile örneklendirir.	
			2.9. Deprem tehlikesine karşı alınabilecek önlemleri ve deprem anında yapılması gerekenleri açıklar.	19. Richter (Rihter) büyüklükleri arasındaki farkı hesaplar.	
			3.3. Rüzgarın oluşumunu deneyle keşfeder. 3.4. Rüzgar ile yel, tayfun, fırtına arasında ilişki kurar. 3.5. Hortum ve kasırganın oluşum şartlarını ifade eder. 3.10. Yeryüzü şekillerinin oluşumu ve değişiminde hava olaylarının etkisini örneklerle açıklar.	5. Rüzgarın yaptığı etkilere örnekler verir. 6. Hortumun güçlerine göre verdiği zararlara örnek verir. 7. Hortumlardan korunma yollarını belirler.	
4	**Matematik**	**Ölçme / Zamanı Ölçme**	1. Dakika ile saniye arasındaki ilişkiyi açıklar.	7. Deprem sürelerini karşılaştırır. 23. Bir depremin ortalama olarak ne kadar sürdüğünü fark eder.	
		Sayılar / Doğal Sayılarla Bölme İşlemi	2. Üç basamaklı doğal sayıları en çok iki basamaklı doğal sayılara böler.	24. Depremle ilgili teknik bilgileri belirtir.	
6		**Sayılar / Tam Sayılar**	2. Tam sayıları karşılaştırır ve sıralar.	5. Rüzgarın yaptığı etkilere örnekler verir.	
		Olasılık ve İstatistik / Tablo ve Grafikler	1. Verileri uygun istatistiksel temsil biçimleri ile gösterir ve yorumlar.	12. Sel sonrasında oluşabilecek tehlikelere karşı alınabilecek önlemlere örnekler sunar.	
7		**Olasılık ve İstatistik / Tablo ve Grafikler**	2. Daire grafiğini oluşturur ve yorumlar.	1. Orman yangınlarının çıkış nedenlerini açıklar.	

		Cebir/Örüntüler ve İlişkiler	1. Tam sayılarının kendileri ile tekrarlı çarpımını üslü nicelik olarak ifade eder.	19. Richter büyüklükleri arasındaki farkları hesaplar.	
8		**Olasılık ve İstatistik/ Olasılık Çeşitleri**	1. Deneysel, teorik ve öznel olasılığı açıklar.	13. Heyelan oluşumundaki nedenleri araştırır.	
5	**Türkçe**	**Dinleme**	3.5. Bilgi edinmek için okur ve dinler.	5. Deprem sırasında karşılaşılabilecek tehlikeleri araştırır. 15. Heyelan sırasında kapalı ve açık alanlarda yapılması gerekenleri nedenleriyle açıklar.	
6-8	**Tarım**	**Modül: Tarım Kültürü**	16. Erozyonun tarıma etkisini açıklar.	12. Sel sonrasında oluşabilecek tehlikelere karşı alınabilecek önlemlere örnekler sunar.	Erozyonla ilgili bir proje çalışması yaptırılabilir.
4-5	**Beden Eğitimi**	**Etkin Katılım ve Sağlıklı Yaşam/ Düzenli Fiziksel Etkinlik**	1.5. Temel ilk yardım ilkelerini fark eder. 1.8. Temel ilk yardım ilkelerini bilir.		
6-8		**Etkin Katılım ve Sağlıklı Yaşam/ Fiziksel Etkinlik ve Beslenme**	1.7. Temel ilk yardım ilkelerinin önemini bilir.		
7		**Etkin Katılım ve Sağlıklı Yaşam/ Düzenli Fiziksel Etkinlik**			
	Trafik Güvenliği	**İlk Yardım**	1. Kaza anında kimlerden ve nasıl yardım istenmesi gerektiğini belirtir. 2. İlk yardım uygulamaların kimler tarafından yapılması gerektiğini açıklar. 3. Araçlardaki ilk yardım çantasında bulunan ilk yardım malzemelerini tanır ve bunların nasıl kullanıldığını açıklar. 4. Hafif yararlanmalarda ilk yardım uygulamalarını açıklar. 5. Ambulansa yol vermenin önemini açıklar.		

APPENDIX D

STUDENT QUESTIONNAIRE

Bölüm 1: Genel Bilgiler *(Demographic Informations)*

1. Okul adı *(School Name):*.....
2. Cinsiyet (*Gender*) ☐ Kız ☐ Erkek
3. Yaşınız (*Age)*:.....
4. Sınıfınız *(Grade):*.....
5. Seçtiğiniz okul kulübü *(School Club):*.....

Bölüm 2: Afet Konuları ile İlgili Algılar ve Afet Eğitimi Uygulamaları *(Perceptions about Disaster-Related Issues and Disaster Education Implementation)*

1. Afet nedir? Nasıl tanımlarsınız? *(Define the concept of disaster in your own words)*

2. Bulunduğunuz bölgede en çok olan afet olayları hangileridir?*(Which are the two most likely disaster(s) that occur in the region)*

   a. Sel (*Flood*)
   b. Deprem (*Earthquake*)
   c. Yangın (*Fire*)
   d. Erozyon (*Erosion*)
   e. Heyelan (*Landslide*)
   f. Okul içi şiddet (*Violence at the school*)
   g. Diğer (Belirtiniz) (*Other, Please specify it*).....

3. Bulunduğunuz bölgede en çok meydana gelen afet olaylarının size, ailenize, okulunuza ve çevrenize ne gibi etkileri olabilir? (*How could the most likely disaster(s) occurring in the region affect you, family members, school, and the environment that you live in?)*

- Size etkisi *(Self-impact):*

- Ailenize etkisi (*Impacts on family members):*

- Okulunuza etkisi *(Impacts on the school):*

- Bulunduğunuz bölgeye, çevrenize etkisi *(Impacts on the environment that you live in)*:

4. Afetlerle ilgili konuları, deneyimlerinizi arkadaşlarınızla konuşur musunuz?*(Have you ever discussed disaster-related issues with your friends)*

   ☐ Evet *(Yes)*

   ☐ Hayır, ama istekliyim *(No, but intend to)*

   ☐ Hayır *(No)*

5. Afetlerle ilgili konuları, deneyimlerinizi ailenizle konuşur musunuz?*(Have you ever discussed disaster-related issues with your parents)*

   ☐ Evet (Yes)

   ☐ Hayır, ama istekliyim *(No, but intend to)*

   ☐ Hayır *(No)*

6. Afetten korunma ve güvenli yaşam eğitimi konusunu derslerde ya da ders dışı etkinliklerle ele alıyor musunuz? *(Have you ever discussed disaster-related issues through curricular activities and extra-curricular activities?)*

	Yeterli düzeyde ele alınıyor *(At sufficient level)*	Bazı eğitimler var ancak yeterli değil*(There are some, but in sufficient)*	Hiç ele alınmıyor*(There is not any)*
Derslerde*(Curricular activities)*			
Ders dışı etkinliklerde*(Extra-curricular Activities)*			

7. Afet eğitimi okulunuzda nasıl ele alınıyor, derslerde ve ders dışı etkinliklerde neler yapılıyor? (*How is disaster education implemented in the school, What types of activities are conducted in relation to disaster education, curricular and extra-curricular activities)*

8. Afet olayları ile ilgili aldığınız dersler sizi nasıl etkiler, size ne gibi katkıları olur? (*How do disaster education activities affect you?)*

9. Sizce depreme karşı ne gibi önlemler alınabilir? (*What can it be done against earthquakes)*

10. Deprem anında nasıl davranmalıyız?*(How should we act during an earthquake)*

11. Deprem sonrasında neler yapmalıyız? *(What should we act after an earthquake)*

12. Ailenizle depremlere karşı hazırlıklı olmak için aşağıdakilerden hangisini ya da hangilerini yaptı? (*Has your family done any of the following to prepare for an earthquake)*

	Evet*(Yes)*	Hayır, ama istekliyim *(No, but intend to)*	Hayır*(No)*
Afet aile planı hazırlamak*(Have a family emergency plan)*			
Kırılabilen ev eşyalarını bize zarar vermeyecek şekilde yerleştirmek*(Re-arrange breakable house items)*			
Büyük eşyaları sabitlemek (*Fix heavy items securely to wall)*			
Afet çantası hazırlamak (*Have an emergency kit)*			
Güvenli çıkışları, toplanma alanını ve elektrik, su ve gaz techizatlarını gösteren bir ev planının olması*(Have a house plan)*			
Evi afetlere karşı sigortalatmak*(Insure house)*			
Evin sağlamlığını yetkililerin incelemesini sağlamak*(Inspect house for earthquake resistance)*			
Raftaki eşyaların kayıp düşmemesi için önlerine çıta			

takmak*(Add lips to shelves to keep things from sliding off)*			
Acil durum malzemeleri bulundurmak (el feneri, yangın söndürme aleti, vs) (*Store emergency equipment)*			
İlk yardım çantası bulundurmak*(Have a first-aid kit)*			
Aileden birinin ilk yardım eğitimi alması*(Someone in family learn to provide first aid)*			
Bulunduğunuz bölge dışından iletişime geçeceğiniz bir yakını belirlemek (*Pick an emergency contact person outside your area)*			
Diğer (belirtiniz) (*Other, Please specify)*			

13. Kendinizi afetle ilgili konularda sorumlu hissediyor musunuz?*(Do you feel yourself responsible for taking proper actions to be more prepared against disasters)*

☐ Evet (*Yes*) ☐ Hayır *(No)*

14. Kendinizi afetle ilgili konularda kendinizi yeterli görüyor musunuz?*(Do you feel yourself confident in taking proper actions to be more prepared against disasters)*

☐ Evet *(Yes)* ☐ Hayır *(No)*

15. Afetle ilgili konularda okul dışında başka hangi kaynaklara başvuruyorsunuz? *(What would you prefer to seek further information about disaster-related issues other than school)*

	Evet *(Yes)*	Hayır, ama istekliyim*(No, but intend to)*	Hayır *(No)*
Aile fertleri*(Family members)*			
Arkadaşlar*(Friends)*			
Kitap *(Books)*			
İnternet *(The Internet)*			
Televizyon, gazete *(Mass Media)*			
Diğer *(Other, Please Specify it)*.....			

16. Afet eğitiminin gerekliliği hakkında ne düşünüyorsunuz?*(What do you think about necessity of disaster education)*

APPENDIX E

TEACHERS' SEMI-STRUCTURED INTERVIEW QUESTIONS

Bölüm 1: Genel Bilgiler (*Demographic Informations)*

1. Branşınız nedir?*(Teaching major)*
2. Ne kadar süredir öğretmenlik yapıyorsunuz?*(Teaching experiences years*)
3. Afet tatbikatlarına katıldınız mı? (*Participated in an emergency practice)*
4. Afet eğitimi ile ilgili hizmet içi eğitim seminerlerine katıldınız mı?*(Participated in in-service seminars in relation to disaster education)*
5. Afetlerle mücadele için çalışan resmi / gayrı resmi kurum ve kuruluşlarda gönüllü olarak çalıştınız mı? (*Working volunteerly in a governmental / non-governmental organization for disaster management)*
6. Daha önce afet deneyimi yaşadınız mı?(sel, deprem, yangın, erozyon, heyelan, okul içi şiddet,vs.) (*Disaster experiences)*

Bölüm 2: Okuldaki Afet Eğitimi Uygulamaları *(Disaster Education Implementation Process)*

1. Afetten korunma ve güvenli yaşam eğitimi konusu okulunuzda nasıl ele alınıyor? (*How do you implement disaster education in your lessons)*
2. Okulunuzda afetten korunma ve güvenli yaşam eğitimine ilişkin aşağıdaki etkinlikler ne kadar sıklıkla, nasıl yapılıyor? (afet planı, afet tatbikatı, anma törenleri, panoya afiş asmak, öğrenci kulüp faaliyetleri, hizmetiçi eğitim seminerleri, vs.) *(How often do you conduct activities in relation to disaster education)*

3. Afetten korunma ve güvenli yaşam eğitimi konusunda okulunuzda nelerin yapılmadığını ve nedenini açıklayınız? *(Is there any activities of disastereducation not conducted in the school? What do you think about the underlying reason of that?)*
4. Okulunuzda afetten korunma ve güvenli yaşam eğitimine ilişkin yapılan etkinliklerin ne kadar etkili olduğunu düşünüyorsunuz? (afet planı, afet tatbikatı, anma törenleri, panoya afiş asmak, öğrenci kulüp faaliyetleri, hizmetiçi eğitim seminerleri, vs.) Eğitimin kapsamı ve süresi yeterli mi? Ne tür sonuçlar elde ediliyor? *(The effectiveness of the activities about disaster education conducted in the school)*
5. Afetten korunma ve güvenli yaşam eğitimine ilişkin karşılaştığınız güçlükler nelerdir? *(The difficulties that you have encountered while teaching disaster-related issues)*
6. Öğrencilerinizin afetten korunma ve güvenli yaşam eğitimine ilişkin öğrendikleri bilgieri ve geliştirdikleri becerileri nasıl ölçüyorsunuz? (testler, projeler, denemeler, ödevler) *(Assessment of students' learning about disaster-related issues)*
7. Öğrencilerinizin afetten korunma ve güvenli yaşam eğitimine ilişkin öğrendikleri bilgileri ve geliştirdikleri becerileri nasıl algılıyorsunuz, bunları ne düzeyde kazandıklarını düşünüyorsunuz? *(Related knowledge and skills that students develop during disaster education process)*
8. Afet eğitimi kapsamında yapılan etkinliklerin size, öğrencilere ve ailelerine etkileri nelerdir? *(The impacts of disaster education on students, their parents and teachers)*

Bölüm 3: Afet Eğitimi Algısı *(Teachers' Approaches to Disaster Education)*

1. Afetten korunma ve güvenli yaşam eğitiminin gerekliliği hakkında ne düşünüyorsunuz? *(Necessity of disaster education)*
2. Afetten korunma ve güvenli yaşam eğitimi sizce nasıl olmalı, nasıl uygulanmalı? *(How do you approach to disaster education, how should it be?)*
3. İleriye yönelik afet eğitimi ile ilgili önerileriniz nelerdir, eksikleri gidermek adına neler yapılabilir? *(Any suggestions to deal with deficiencies in relation to disaster education)*

APPENDIX F

STUDENTS' SEMI-STRUCTURED INTERVIEW QUESTIONS

1. Sizce ölümle sonuçlanan afet olaylarında temel sebepler ne olabilir? *(Underliying reasons of disasters)*
2. Bu tarz afet olayları ile ilgili ailenizle konuşur musunuz, konuyu kim açar, neler konuşursunuz? *(Communication with parents)*
3. Okulda afet eğitimi nasıl veriliyor, ne gibi etkinlikler yapılıyor? *(Disaster education implementation in the school)*
4. Sizce afet eğitiminde en uygun yöntem nasıl olmalı?Afet eğitimi ile ilgili ne tür etkinlikleri ilgi çekici ve anlamlı buluyorsunuz? *(Teaching methods of disaster education)*
5. Derslerde yapılan afet eğitimi etkinliklerini nasıl karşılaştırırsınız? *(What do you think about disaster education activities in the school)*
6. Afet eğitimi ile ilgili ne tür bigiler kalıcı oluyor? *(Permanent knowledge developed through disaster education)*
7. Derslerde yapılan afet eğitiminin size neler kattığını düşünüyorsunuz? *(Self-impact of disaster education)*
8. Sizce afet eğitimi nasıl olmalı, süreç nasıl işlemeli? *(Approach to disaster education)*
9. Herhangi bir afet olayıyla karşılaştığınızda nasıl davranmanız gerektiğini biliyor musunuz? Listeler misin? *(Knowledge about correct actions for disasters)*

10. Okulda, evde acil durumlar için nasıl hazırlık yapılması gerektiğini konuşuyor musunuz, neler konuşuyorsunuz? *(School encouragement for student-parent communication)*

APPENDIX G

OBSERVATION FORM

	Alt başlıklar *(Sub-Categories)*	**Notlar** *(Field Notes)*
Okul tabanlı hazırlıklar ***(School-Based Disaster Education Activities)***	Okul afet ve acil durumlar hazırlık komitesi oluşturma*(Committee of school emergency disaster management)* Okul afet planı hazırlama*(School emergency and disaster management plan)* Acil durumlar için tahliye planı hazırlama*(School evacuation plan)* Acil durumlar için sığınak hazırlama (*School emergency shelter)* Afet sonrası eğitim devamlılığı için alternatif mekanlar, öğretim yöntemleri ve programlar hazırlama *(Recovery actions after disasters)* Her yaş grubu öğrenci için afet risk farkındalığı ve risk azaltma etkinlikleri hazırlayıp uygulama*(Activities of disaster risk reduction for students at different level)* Öğretmen ve öğrencilerin evlerinde afet hazırlığı yapmaları için teşvik etme*(Encouragement of child-parent communication)*	
Fiziksel korunmaya yönelik hazırlıklar ***(Structural***	Uzun ve ağır eşyaları sabitleme *(Fixing heavy items securely to walls)* Bilgisayar, televizyon gibi elektronik eşyaları, kimyasal maddeler gibi afet	

Preparedness Measures)	anında tehlike arzedecek maddeleri koruma altına alma *(Storing hazardous materials safely)* Duman detektörü, yangın alarmı, yangın söndürme aleti, yangın tüpü bulundurma *(Having fire alarm, fire extinguisher, and smoke detector)*	
Sınıf tabanlı hazırlıklar *(Class-Based Disaster Education Activities)*	Sınıflarda ilk yardım çantası bulundurma *(Having first-aid kit)* Öğrencilere afet öncesinde, anında ve sonrasında neler yapılacağı konusunda çeşitli aktiviteler ve tatbikatlar yaptırma *(Conducting emergency practices)* Afet eğitimi ile kullanılan materyaller, yöntemler *(Disaster education teaching methods and materials)* Afişler, panolar, diğer görsel etkinlikler *(Visual-materials)* Sloganlar /deyimler *(Slogans)*	

APPENDIX H

DESIGNING A POSTER


VAKİT
VARKEN
AL!
VAKİT
VARKEN

APPENDIX I

ACROSTIC COMPETITION

APPENDIX J

RAP MUSIC COMPETITION

APPENDIX K

DISCUSSION SESSION

APPENDIX L

SAMPLE TRANSCRIBED INTERVIEW WITH TEACHER

Respondent: Participant A **Date**: 17.10.2012 **Duration**: 25:36

Interviewer (I): Yapmakta olduğumuz görüşme araştırma çerçevesi içinde kalacak. İsminiz de belirtilmeyecek. Görüşmenin kaydedilmesi konusunda bir problem var mı?

Respondent (R): Yok, hiç problem değil.

I: Branşınızı öğrenebilir miyim?

R: Ben Rehber öğretmeniyim.

I: Ne kadar süredir görev yapıyorsunuz?

R: 7. yılımdayım şu anda.

I: Daha önce herhangi afet tatbikatına katıldınız mı?

R: Çok kapsamlı değil ama tahliye tatbikatı olmuştu afet sonrası.

I: Bu okulda değil mi?

R: Yani bu okulda oldu. Çocukluğumda filan da olmuştu ama o kadar aslında.

I: Peki. Daha önce afet eğitimiyle alakalı hizmet içi eğitim seminerine katıldınız mı?

R: Evet katıldım, bu okulda katıldım.

I: Hangi seminerlere peki? Proje kapsamındaki seminerler mi?

R: Evet.

I: Onun dışında?

R: Hayır katılmadım.

I: Peki, afetlerle mücadele için çalışan resmi / gayri resmi kurum ve kuruluşlarda gönüllü olarak çalıştınız mı ya da herhangi bir rol aldınız mı?

R: Yok, almadım.

I: Afet deneyimi daha önce yaşadınız mı?

R: Yani afetten sayılır mı bilmiyorum ama bu 99 depreminde Gemlik'teydim ben. O sarsıntıyı hissettim sadece. Buradaki kadar yoğun değildi ama.

I: Hımm. Anladım.

I: Şimdi okuldaki afet eğitimiyle alakalı sorulara geçebiliriz. Afetten korunma ve güvenli yaşam eğitimi konusunda okulunuzda neler yapılıyor? Burada öğretmenlik deneyiminiz boyunca projeden önce nasıl ele alınıyordu? Bu projeyle neler değişti?
R: Ben burada 3 yıldır görev yapıyorum. Bu projeden önce de tahliye tatbikatlarımız vardı ama hani programda var diye yapılan tahliye tatbikatlarıydı. İşin açıkçası çok bilinçli bir şekilde yapmıyorduk. Hani tahliyeyi yapıyorduk olduğu gibi, öğrencileri çıkartıyorduk, kendimiz de aynı şekilde. Üstüne konuşmuyorduk. Acaba biz yanlış bir şey yaptık mı? Ve şeyi bilmiyorduk. Çocuklar ne biliyor ne bilmiyor onu pek önemsemiyorduk. Sadece maksat tahliye tatbikatını yapıp dışarı çıkartmaktı çocukları. Bu şekildeydi.
I: Bu projeyle de tatbikat yapmaya devam ettiniz mi?
R: Çok yaptık ve çok şey değişti projeyle ilgili olarak söylersem eğer. Önce çocukların neyi bilip bilmediğini öğrendik. Aynı şekilde gerçek bir afet durumunda biz ne yapacağız bunu bir sorgulamaya başladık. Ve sık sık yapmaya başladık tatbikatları ki bizde de davranış haline gelebilsin diye. Çok şey değiştirdi yani.
I: Evet, peki. Okulunuzda projeyle beraber tatbikatlar dışında başka ne gibi değişiklikler oldu?
R: Eskiden bilgilendirici çalışmalar daha az yapılırdı. Şimdi okulumuzu birazdan gezdirdiğimizde gösteririz neler yaptığımızı bu konuda. Yani, bizim bu zamana kadar öğrendiğimiz şey hani tahliye ne olur, afetten sonra yapılan bir şeydir. Oysaki biz zarar azaltma çalışması diyoruz buna. Hani afet öncesinde de bir şeyler yapılması lazım. Japonlardan eğitim aldık. Hani farkımız oydu. Biz işte afet sonrasında ekmek, su, gibi şeylerle ilgilendik. Yani biz bunu gördük. Oysaki afet öncesinde yapılacak bir sürü şey var ki bunlar insanların hayatta kalmasını sağlıyor. En büyük farklılık bu oldu benim içinde, çocuklar içinde. Mesela ben bile, aslında bu çok acı da bir şey, şeyi bilmezdim. Yani hani, camlardan 60 cm uzaklıkta olması gerek yatağın, masanın, vs. koltuğun. Ben de bile bununla oturdu bu davranış. Ya da işte çök-kapan-tutun. Ne yapıyorduk, heyecanlanıyorduk biz. Hemen ayağa kalkmaya çalışıyordum. Benim yaşadığım deprem o Gölcük depremiydi. Onda gerçekten çok saçma sapan davranmışım. Bunu düşünüyorum.
I: Bu biraz da daha önce öyle bir şey yaşamamış olmanın verdiği panik ile alakası var sanırım.

R: Aslında öyle ama. Eğer bilseydim ben ne olduğunu daha bilinçli yaklaşabilirdim. Dediğim gibi biz öncesinde neler yapılması gerek buna çok eğildik. Bu yönden benim için de çok faydalı oldu. Çocuklar için de öyle. Yani hem eğlendik hem öğrendik diyebilirim.
I: Peki, derslerde bildiğiniz kadarıyla ne düzeyde ele alınıyor?
R: Derslerde yine müfredatta olan konular vardı. Proje öncesi için söylüyorum. Hani öyle çoğu kişi bilmezdi.
I: Aslında benim bildiğim kadarıyla "yapılandırmacı yaklaşımı" temel alan yeni programlar geliştirildi. Ondan sonra afet eğitimi ara disiplin olarak yerleştirildi programlara. Mesela 1. Sınıf hayat bilgisi dersinde de ara ara kazanım olarak ele alınıyor. Ama yeterli düzeyde ele alına biliniyor mu sizce?
R: Biz mesela bariz görüyoruz. Arkadaşlarla da konuşuyorum. Ara disiplin olarak alınıyor ama hani o ders saatinde bir ders süresince bir etkinlik. Oysaki bizim afet eğitimin yaşam boyu olması lazım. Ve hani sadece orda yer alan konularla ilgili değil. Mesela günlük hayattan da örnekler verilmesi gerekir. Bizim projeye dahil olmadan önce evet ara disiplin olarak ele alınıyordu. Ders, konular işleniyordu. Ama projeyle beraber bizim matematik dersimize bile girdi bu konu. Müfredat dahilinde tabi yine ayarlandı. İşte mesela matematik öğretmenimiz konuyla ilgili sorular hazırladı. İşte bir deprem çantası ne kadara mal olur gibi. Ya da işte malzemeler hazırlattı diğer öğretmenlerimiz. Her dersin içine yerleştirilmeye çalışıldı ki rehberlikte bile var. Benim eşsiz yuvam diye bir etkinlik. Tüm müfredatın içinde ne yapabiliriz diye düşünüldü. Normal müfredatın dışında bir de ders planı olarak dersin içinde soru olarak çocukların düşünmesini teşvik edici etkinlikler yapıldı.
I: Bu kapsamda yapılan etkinliklerden biraz daha konuşmak istiyorum. Mesela afet planı hazırladınız mı?
R: Projeden önce de sivil savunma planı olarak hazırlanmıştı. Projeyle beraber plan tamamen revize edildi. Çünkü bizim sivil savunma planlarımız yeni hazırladığımız afet planlarına çok uygun değildi. İçerikleri hemen hemen aynıydı. Ama afet planı biraz daha kapsamlıydı. Daha çok güncel sorular içeriyordu. Mesela yerleştirme planları. Geçtik üstünden. İşte sürekli güncellemeye çalışıyoruz okulun durumuna göre. Hem okulla ilgili hem personelle ilgili daha kapsamlı afet planı hazırladık.
I: Tatbikatları konuştuk. Peki, başka ne gibi etkinlikler yaptınız?

R: Yani Gölcükte olduğumuz için anma törenleri yapılıyor. Proje kapsamında okulda da yapmayı planlıyoruz. Belki de geç kaldık.
I: Aslında bu bir süreç. Böyle şeyler ekstra emek istiyor.
R: Evet, ama eksikliklerimizi görünce, Japonların anma törenlerinin fotoğraflarını görmüştüm. Bu da bir fikir olabilir tabi. Aslında biz biraz da yapılış yolunu bilmiyoruz. Aslında çocukları korkutmadan da gayet güzel şeyler yapılabilir.
I: Okulda bu konuyla ilgili öğrencileri bilgilendirmek adına bir panonuz var mı peki?
R: Mesela afet köşemiz var. Onda bilgilerimiz var. Olabildiğince güncellemeye çalışıyoruz. Afet konusuyla ilgili bilgiler var. Çocuklara afiş çalışması yaptırdık afet bilinciyle ilgili. Fotoğrafları da var bakabilirsiniz. Çok güzel şeyler çıktı gerçekten. Tüm afetleri kattılar işin içine ama depremle ilgili güzel sloganlarda bulundu. Gayet güzeldi hani. Bu tür çalışmaları yapıyoruz.
I: Öğrenci kulüplerinde nasıl ele alındı?
R: Bizim aile, öğretmen ve öğrenci eğitimlerimiz oldu konuyla ilgili. Öğrenci eğitimlerinde hani biz farklılık olsun istedik. Öğretmenin birebir eğitim vermesi yerine biz belli başlı öğrencilere öğretelim. Onlar arkadaşlarına öğretsin. Bazen yeri geliyor öğrenciler kendi arkadaşlarını çok daha iyi dinliyorlar. Mesela sivil savunma kulübü öğrencilerimiz bunu yaptılar. Hareketleri gösterdiler. Minik sınıflarda kendileri yaptırdılar hareketleri. Onlarla ilgili videolarımız filan da vardı. Afeti anlattılar. Doğal olaylardan başladılar. Tüm bir ders boyunca dolu dolu içerik ve bunlara karşı nasıl hazırlıklı olmamız lazım gibi bunlarla ilgili çocuklar çocuklara bilgi verdi. Hani öğrenciyi eğitmek için öğrenciden yararlandık. Çok da güzel oldu çocuklar için.
I: İyi fikir gerçekten. Peki, bu tarz program içi ve program dışı etkinliklerin ne düzeyde yararlı ya da etkili olduğunu düşünüyorsunuz? Etkisini görebilmek için belki bir şey yaşamak gerekir. Yani diğer konularla ilgili etkinler gibi ölçülemez belki öğrencinin ne düzeyde kazandığını ama en azından bir farkındalık yarattığını düşünüyor musunuz?
R: ben bir farkındalık yarattığını düşünüyorum çocuklarda. Mesela biz afet eğitimini verdikten sonra çok hoşuma gitti. Bazı sınıflara girdiğimizde ki hani biz bunu biliyoruz ama bilmeyen arkadaşlarımız da var. Bizim verdiğimiz eğitimden sonra hemen çocuklar masalarını camlardan 60 cm uzaklığa çekmişler. Hatta diğer

öğretmen arkadaşlar şaşırmışlar. Siz niye böyle yaptınız diye. Çocuklar hemen açıklamışlar. Hani bu küçük hareketler bile aslında bizim ne kadar büyük bir iş yaptığımızı gösteriyor.

I: Velilere bu durum nasıl yansıdı?

R: Veli eğitimlerimiz de oldu. Bu eğitimleri alan birçok velimiz artık çantasında el feneri bulunduruyor. Yani en azından kendimden örnek vereyim. Benim çantamda el feneri falan gezmezdi. Ama şimdi benim el fenerim var çantamda. Sırf bu durumlara hazırlıklı olabilmek için.

I: Anladım. Peki, karşılaştığınız güçlükler neler genel anlamda düşünecek olursak?

R: Şöyle söyleyeyim. Arkadaşlarımız gerçekten müfredatı çok yoğun işliyorlar, diğer öğretmen arkadaşlarımız. Ama bizim bu işi de yapmamız lazım. Ve bunun içinde bir zaman ayırmamız lazım, emek harcanması lazım. Mesela bizim sadece öğretmen eğitimimiz 2 buçuk 3 saat sürdü. Bu da demek oluyor ki işte öğretmen ders bitimi sonrasında bir 3 saat daha burada kalması lazım. Mesela bu çok büyük bir sıkıntı oldu bizim için. Yani hem zaten fiziksel anlamda biz yorulduk. Hem de arkadaşlar o kadar saat derse giriyorlar, bir de üstüne böyle bir eğitimi aldılar. Yani hani bu eğitimlerin bence ne bileyim seminer dönemlerinde olması lazım. Resmi olarak olması lazım. Mesela, çoğu arkadaş çok istekliydi ama bazı arkadaşlar da isteksizdi. Çünkü sanki bizim keyfi işimizmiş gibi davrandılar mesela. Oysaki bu olması gereken bir şey. Hani biraz daha prosedür kısmına takılmamak lazım. Daha resmi olması da lazım bir yandan.

I: herhalde biz de oturana kadar böyle şeyler biraz tepeden gelmesi gerek.

R: Maalesef öyle. Biz bir acı yaşamadan bunların ne kadar önemli olduğunu göremiyoruz.

I: ya da çabuk unutuyoruz.

R: kesinlikle.

I: Peki maddi anlamda hani mesela dolaplar sabitlenmiş, her öğrencinin acil durum, deprem çantası olması için teşvik edilmiş, vb. durumlar için maddi anlamda bir sıkıntı yaşadınız mı?

R: Tabi ki. Mesela her şeyi kendi çabamızla yapmaya çalışıyoruz. Proje kapsamında olduğu için belirli bir vaktimiz var diye düşündük. Ama ilk yardım çantalarımız gerçekten eksik yani şu anlamda. Ama onun dışında mesela çocuklara deprem

çantaları filan hazırlattık. Gönüllü veliler tarafından, gönüllü öğrenciler tarafından hazırlandı. Yine dolap sabitleme konusunda okul müdürümüz destek veriyor. Çıkış yönlerimizi ayarladık. Pek bütçemiz yok ama bu kısıtlı bütçeyle elimizden geleni en iyisini yapmaya çalıştık. Hala sabitlemediğimiz bilgisayarlar var. Bir sonraki basamak onlar olacak. Ya da sıralar olacak. Mesela biz çocuğa diyoruz ki sıranın altına geçeceksin, çök-kapan-tutun yapacaksın. Oysaki sabitlenmeyen bir sıranın altında biz çocuğa nasıl tutun diyebiliriz. Sıra zaten hareket edecek herhangi bir afet anında. Ama bunlar da dediğim gibi zaman zaman yapılacak şeyler.

I: Öğrencilerin afet eğitimine ilişkin öğrendikleri bilgileri, geliştirdikleri tutum ve becerileri nasıl ölçüyorsunuz?

R: Tatbikat yapılabilir. Ya da işte panoya hazırlık yaparken ya da kulüp çalışmalarında öğrencilerin aktif rol almaları sağlanabilir. Yarışmalar yapılabilir. Slogan, akrostiş yarışmaları düzenlendi.

I: siz öğrencilerle iletişime geçiyorsunuz. Öğrencilerin ailelerle iletişime geçmesi için teşvik edilmesi konusunda ne düşünüyorsunuz? Ailelere nasıl yansıyor bu süreç?

R: her öğrenciden böyle geri dönüşler alınmadı fakat bazı öğrencilerden dönüt aldık. Mesela afet planı hazırlayan, evde bir afet durumunda nerde toplanılması gerektiğini aileleriyle konuşan öğrencilerimiz oldu. Ailelerde de bir farkındalık olduğuna eminim ben. Mesela aile eğitimlerinde en çok üzerinde durduğum konu DASK'tı. Eviniz sigortalı olsun. Belki birazcık daha bunun üzerine gidilebilir. Çünkü bizim mahallemizde birçok aile kendi evinde oturuyor. Öyle dönütler de oldu. Bizim bundan haberimiz yoktu öğrendik diye. Memnun da kaldılar. Çocuklar da aynı şekilde. Ailelerde bir farkındalık olduğunu düşünüyorum.

I: Peki aile eğitimlerine katılım nasıldı?

R: Tahminimden iyiydi. Hem afet ile ilgili hem de psiko-eğitim seminerleri verdik. Yine aynı şekilde katılım iyiydi. Afiş, broşür hazırladık. Sunumlarımız hep görseldi. O nedenle ilgilerini çekti.

I: Eğitimin gerekliliği hakkında ne düşünüyorsunuz?

R: Sonuçta bu tür eğitimlerin fazlaca olması can kaybını önlemek ve zararları azaltmak içindir. Eğer biz insana değer veriyorsak aslında sadece eğitim boyutuyla değil bence yaşamın her alanında olmalı. Ama biz maalesef ki televizyonda bile hemen bir deprem sonrası uzmanlar çıkıp ne yapılması gerektiğinden konuşurlar.

Hep afet sonrasında yapılabileceklere dönüktür. Onun dışında ben hiç hatırlamıyorum herhangi bir dizide bununla ilgili neler yapılmalı konusunda herhangi bir şey anlatılmıyor. Oysaki bunun yaşantı olması lazım. Belki Japonlarla aramızdaki fark budur. Kamusal boyuta taşıyamadık biz bu işi. Herkes aynı bilinçle yaklaşmıyor bu işe. Biz burada çocuklara anlatıyoruz ama dışarı çıkınca çocuk birine anlatınca aynı istek ve tepkiyle karşılaşmıyor.

I: Afet eğitimi sizce nasıl olmalı, nasıl uygulanmalı?

R: bana soracak olursanız ayrı bir ders olarak birinci sınıftan 8. Sınıfa kadar, 9.sınıftan 13. Sınıfa kadar ders planı kapsamında okutulmalı. Ayrı kitabı, ayrı malzeme, materyalleri olması gerekir. Mesela Japonlar bunu çok sistematik yapabilmişler. Bizim aldığımız eğitimlerin birinde bir deney görseli deprem dalgalarının bir evi nasıl etkilediği anlatılıyor. Normalde o malzeme 4000 dolar civarında. Ama bizim de önümüzde belki böyle örnekler olursa daha iyi olur diye düşünüyorum. Benzer modeli pamuk çubuğuyla yapmışlar ve bir dolara getirmişler maliyetini. Yani don lastiği ve pamuk çubuğuyla o dizaynı yapmışlar. Hatta biz de yaptık. Bu tür şeyleri düşünebilmek için o görsellik o tür örnekler şart. Biz de ortada bir şey yok ama siz bir şeyler yapın denilebiliyor. Belki bu düzeyde değiliz biz daha. Çünkü bizim dönemimizde daha ezberci bir sistem vardı.

I: Evet benim de anladığım kadarıyla projenin amacı daha yeni yeni böyle bir kültür oluşturmak. Önce formatör öğretmen sonra öğrenci daha sonra ailelere böyle bir kültürü aşılamak.

R: aslında insana değer veriliyorsa aslında olması gereken bu. O söz beni çok etkiledi. Japon atasözü afetler unuttuğumuz zaman gelir diye. Adamlar bundan yola çıkarak neler neler yapmışlar. Biz mesela en yakınımızda Van depremi, onu bile unuttuk. Çok çabuk unutuldu.

R:İleriye yönelik önerileriniz planlarınız nelerdir?

I: Ben istiyorum ki herkes bu sürece dahil olsun başta öğretmenler halkla daha iç içe olabildikleri için. Belki bizim önümüzdeki yıl mahallemizi dahil edecek bir proje geliştirilebilir. Bizim yaptığımız etkinlikler de çok orijinal geliyor bana. Mahalledeki insanlara yaygınlaştırılabilir. Basın daha fazla kullanılabilir. Mesela biz yerel basını kullandık. Çok da iyi oldu. Bizim okulumuzu daha önce bilmeyen insanlar ben başka okullara da gittim. Oradaki veliler filan gazeteden okumuş mesela. Gölcük gibi bir

yerde bunu yapmış. Bir de ulusal basını düşünüyorum bunun etkisi ne olur diye. En azından işe yarar doğru düzgün işler yapıldığını, teşvik amaçlı aktarılabilir basın yoluyla. Ya da bir okul gazetesi çıkarılabilir. Mesela afet haftasında velilerin de katılabileceği bir etkinlik yapılabilir.

APPENDIX M

TURKISH SUMMARY

TÜRKÇE ÖZET

OKULDA ÖĞRETİM PROGRAMI VE PROGRAM DIŞI ETKİNLİKLER YOLUYLA AFET EĞİTİMİ: KARŞILAŞTIRMALI ÖRNEK OLAY ÇALIŞMASI

GİRİŞ

Tarih boyunca, dünya genelinde can ve mal kaybı gibi olumsuzluklara yol açan afetler doğa ya da insan kaynaklı olmasına bakılmaksızın sık sık karşımıza çıkmaktadır. Son zamanlarda, gerek doğal afetlerin gerekse insan kaynaklı afetlerin meydana gelme sıklıklarının artması ile beraber ortaya çıkan tablo pek iç açıcı gözükmemektedir.Bu durum afetlerin olumsuz sonuçlarını minimuma indirebilmek için çeşitli stratejiler geliştirme ihtiyacını doğurmuştur. Sonuç olarak, güvenli bir toplum oluşturmak için her bireyin afetlerle ilgili konularda bilinçlendirilmesinin önemli bir unsur olduğu ortaya çıkmıştır (UN/ISDR, 2012).

Bütün bunlar dikkate alındığında afet eğitiminin insanları bilinçlendirmek ve onlarda gerekli afet yönetimi bilgi ve becerileri geliştirmek için yadsınamaz bir rolü olduğu görülmektedir (Lidstone, 1995). Çeşitli kurumların bu konuyla alakalı gösterdikleri çaba küçünsenmemekle beraber yeterliliği tartışılır. Bu bağlamda yapılan çalışmalar ile okulun afet bilinci geliştirmek ve afet riski azaltmak için gerekli bilgi ve becerileri kazandırmak konusunda olumlu etkileri olduğu vurgulanmaktadır (Adiyoso & Kanegae, 2012; Hosseini & Izadkhah, 2006; Johnston, et al., 2011; Ozmen, 2006; Ronan & Johnston, 2005; Shaw & Kobayashi, 2001; Shaw, Shiwaku, Kobayashi, & Kobayashi, 2004; Shiwaku, Shaw, Kandel, Shrestha, & Dixit, 2007; Shiwaku & Shaw, 2008; Petal & Izadkhah, 2008).

İlgili literatür incelendiğinde, afet eğitimi konusunda başarılı olan okulların sahip olduğu iki önemli özellik dikkat çekmektedir. Bunlardan birincisi afet eğitiminin öğrencinin aktif katılımını teşvik edecek şekilde uygulanmasıdır. Petal (2009)' a göre, afet eğitimi bireylerin afetlerin zararlarını azaltmada kendi güçlerini keşfetmelerini teşvik etmelidir. Afet eğitimi sadece afetlerle ve onlardan korunma yollarıyla ilgili bilgileri aktarmakla sınırlı olmamalıdır. Ayrıca, afet eğitimi aracılığıyla afetlere sebep olabilecek insan kaynaklı faaliyetleri de anlatıp davranış değişikliği oluşturulmalıdır.

Afet eğitiminde dikkat edilmesi gereken diğer bir husus da öğretmenlerin afet eğitimini en iyi şekilde verebilmesi için gerekli desteğin sağlanması ile ilgilidir.Yapılan çalışmalar ile, öğretmenlerin kendilerini etkili bir afet eğitimi öğretimi için yeterli görmedikleri ortaya çıkmıştır (Buluş-Kırıkkaya, Oğuz-Ünver, & Çakır, 2011). Bu anlamda, eğitim fakültelerinin ve hizmet içi eğitimlerin yetersiz kaldığı söylenebilir. Öğretmenlerin pek çoğu, afet eğitimi verirken, geleneksel öğretim yöntemleri kullanmayı tercih ediyorlar. Genellikle, düz anlatım ve soru sorma yoluyla afet eğitimi gerçekleşiyor (Öcal, 2005). Literatürde, ilgili çalışmalar afet eğitiminin en etkili öğrenci katılımlı yaklaşımlar temel alınarak verilince gerçekleştiği görülmektedir. Bu da demek oluyor ki, geleneksel yöntemler yerine, başarıli bir afet eğitimi için öğrencilerin aktif katılımını sağlayacak yaklaşımları temel almak gerekmektedir.

Ek olarak, yapılan çalışmalar gösteriyor ki, öğrenciler afetlerle ilgili bazı konularda kavram yanılgılarına sahipler. Altay (2010) yaptığı çalışmada, ortaokul öğrencilerinin deprem konusuyla ilgili algılarını ölçmeyi amaçlamıştır. Araştırmadan elde edilen sonuçlara göre, öğrencilerin büyük bir çoğunluğu depremi olumsuz algıladıkları ortaya çıkmıştır. Bu durumda yaşları itibariyle henüz deprem yaşamamış olmalarına rağmen, öğrenciler çevrelerindeki kişilerden ve medyadan çeşitli bilgiler edinmeleri depreme olumsuz yaklaşmalarına sebep olmuştur. Bu durum öğrencilerin depreme hazırlanma durumlarını da olumsuz etkileyebilir. İlgili çalışmalar ile kişilerin gerçek dışı risk algısı, kişisel deneyimler, gerekli eğitimin alınmaması gibi durumlar depreme hazırlıklı olmak için alınması gereken davranışları olumsuz etkilediği görülmüştür (Becker, Paton, Johnston, ve Ronan, 2013; Whitney, Lindell, ve Nyugen, 2004). Böyle bakıldığında, var olan eğitimlerin de öğrencilerin bu

olumsuz algılarını değiştirmede yetersiz kaldığı sonucuna varılabilir. Başarılı bir afet eğitimi ile öğrenciler sahip oldukları olumsuz düşünceleri değiştirerek afetlere karşı yapılacak birşeylerin olduğunun farkına varmaları sağlanabilir. Böylece, kendilerine afetlere karşı direnli olma konusunda güvenebilirler ve ilgili bilgi ve beceriyi kolayca geliştirebilirler.

Bunun dışında, başarılı afet eğitimi örnekleri incelendiğinde, dikkat çeken bir diğer husus ise, afet eğitimini okulun sınırlarının dışına çıkararak toplumun her kesiminden bireylere ulaşılmasının önemi ile ilgilidir. Literatürde, öğrencilerin okulda edindikleri gerekli bilgileri evde aileleriyle konuşup tartışmaları için teşvik edilmesi gerektiği savunulmuştur. Çünkü yaşları itibariyle öğrenciler tek başına sadece bireysel hazırlık yapabilirler ve evde afetlere karşı dirençli bir ortam oluşturmak yetişkinlerin sorumluluğundadır. Başarılı bir afet eğitimi yetişkinlere de ulaşmayı hedeflemeli ve bu çocuk-aile etkileşimini arttırarak başarabileceği yapılan çalışmalar ile kanıtlanmıştır (Ronan, ve Johnston, 2001).

Diğer bir yandan, afet eğitiminin küçük yaşta başlaması ve sürekli devam etmesi de gerekmektedir. Eğitimin temelinde kişilerde davranış değişikliği oluşturma vardır. Böyle bakıldığında, küçük yaşta edinilen bilgilerin hem daha kalıcı olduğu düşünülebilir. İnsanların davranış değişiklikleri bahsi geçtiği gibi kolay bir konu değildir. Aksine, zorlu bir yolculuktur ve ne kadar erken başlanırsa, o kadar çok başarı sağlanacaktır. Bütün bunlar dikkate alındığında, afetlere karşı dirençli bir toplum oluşturmak için geleceğimiz olan çocuklara bu bilinci küçük yaşlarda aşılamalı ve onların gerekli becerilere sahip olabilme şanslarını arttırmaya çalışmalıyız.

1.1 Araştırmanın Amacı

Bu çalışmanın amacı, orta okul düzeyinde yer alan resmi afet eğitimi programının hali hazırdaki durumunu ve okul tabanlı afet eğitimi proje okullarında yer alan afet eğitimi ile ilgili program dışı etkinliklerin öğrencilerin konuyla ilgili farkındalıklarının arttırılmasına, afetlerle baş edebilme kapasitelerinin, ve yetilerinin artmasına ve herhangi bir acil durum anında gerektiği gibi davranabilmelerine, ve son olarak öğretmenlerin afet eğitimine karşı yaklaşımlarına etkilerini tesbit etmektir.

Bu araştırma kapsamında ele alınan araştırma soruları aşağıdaki şekildedir:

1. Orta okul düzeyinde yer alan afet eğitiminin hali hazırdaki durumu nedir?
2. Öğretmenler afet eğitimini nasıl ele almaktadır?
3. Iki farklı yaklaşımı dikkate alan okullarda (biri programda yer aldığı şekilde, diğeri ise ek olarak program dışı aktiviteler aracılığıyla gerçekleştirilen) afet eğitimi süreci ve sonuçları nasıl değişmektedir?
    a) Öğrencilerin edindikleri bilgi ve beceriler nasıl değişmektedir?
    b) Öğretmenlerin afet eğitimine yaklaşımı nasıl değişmektedir?
    c) Evde afetlere karşı hazırlıklı olmak için alınan önlemler nasıl değişmektedir?

1.2 Araştırmanın Önemi

Yapılan çalışmalar eğitimin afet riskini azaltacak kişisel hazırlıklar üzerinde önemli bir etkisi olduğunu ortaya koymaktadır. Afet eğitimi almış kişilerin afetlere karşı daha hazırlıklı oldukları görülmektedir (Morrisey, 2007; Muttarak, ve Potihisiri, 2013). Bu bağlamda afet eğitimin günlük hayatımızda ne kadar önemli olduğu açığa çıkmaktadır. Bu nedenle afete hazırlıklı bir toplum oluşturmak için afet eğitimine küçük yaşta başlanılmalıdır. Böylece edinilen davranışlar daha kalıcı olur ve yaşam boyu kullanılırAyrıca, küçük yaştaki çocukların öğrendikleri bilgileri evde ailelerine aktardıkları ortaya çıkmıştır (Finnis, Standring, Johnston, ve Ronan, 2004; Johsnton, ve diğerleri, 2011; Ronan, ve Johnston, 2005; Stoltman, Lidstone, ve Dechani, 2007). Bu durumda sadece çocukların kişisel hazırlığı geliştirilmiş olmuyor, aynı zamanda ailelerinde bu tür hazırlıklardan haberleri oluyor, ve böylece evdeki afetlere karşı direnç de artmış oluyor.

Diğer taraftan, yapılan çalışmalar Türkiye'deki afet eğitimin bazı eksikliklerinin olduğunu ortaya çıkarmıştır. Yapılan çalışmalar öğretmenlenlerin afet eğitimi konusunda kendilerini pedagojik ve içerik bakımından yeterli görmediklerini ortaya çıkarmıştır (Buluş-Kırıkkaya, Oğuz-Ünver, & Çakır, 2011; Öcal, 2005). Buna bağlı olarak etkili bir afet eğitimi için öğretmenlerin bu konudaki eksiklikliklerini gidermek gerekmektedir. Bu da şüphesiz ki eğitim fakültelerinin ve hizmet içi eğitimlerin öneminin tekrar gündeme gelmesine yol açmaktadır.

Ek olarak, Türkiye'de afet eğitimi yeni yeni afet yönetiminin bir parçası olarak ele alınmaktadır. Mevcut afet eğitimini değerlendiren bazı çalışmalar yapılmış olsa da, yeterince olmadığı literatür taramasından anlaşılmıştır. Bu sebeple, hali hazırda okullarda yer alan afet eğitiminin değerlendirilmesi gerekmektedir. Çalışmanın sonuçları, öğrencilere daha çok katılımcı bir ortam sağlayan ve program dışı aktivitelerle zenginleştirilmiş bir afet eğitiminin konularla ilgili farkındalık, afetlere karşı kişisel hazırlık, evde alınması gereken önlemler ve konuyla ilgili öğrenci ve aile arasındaki etkileşimi üzerine etkilerini tesbit ederek var olan literature katkıda bulunabilir.

ARAŞTIRMANIN YÖNTEMİ

Bu araştırma kapsamında afet eğitimine iki farklı açıdan yaklaşan okullar araştırma soruları çerçevesinde karşılaştırılmıştır. Araştırmada ele alınan okullardan bir tanesi var olan afet eğitimi programını uygularken, diğer okul ek olarak program dışı aktiviteler de uygulamıştır. Bu iki okul karşılaştırılarak afet eğitimi kapsamında uygulanan program dışı aktivitelerin öğrencilerin farkındalık ve kişisel hazırlık düzeylerine, öğretmenlerin afet eğitimine yaklaşımlarının üzerine,ve evde alınan tedbirler üzerine ne gibi etkilerin olduğunu ortaya çıkarmak amaçlanmıştır. Programa ek olarak uygulanan program dışı aktivitelerle zenginleştirilmiş afet eğitimi uygulaması şu anki afet eğitimine yaklaşımdan farklı olduğu için bu çalışma örnek olay çalışması niteliğindedir.

Bu örnek olay çalışmasında öğrencilere, ailelerine ve öğretmenlere ilgili bilgi ve beceri kazandırmayı amaçlayan programda yer alan afet eğitimi uygulamaları yanı sıra zenginleştirilmiş program dışı aktivitelerin etkililiğini değerlendirmek amaçlanmıştır. Bu sebeple, proje kapsamında çeşitli öğretmen eğitimleri verilmiş ve öğretmenler etkili bir afet eğitimi için teşvik edilmiştir. Öğretmenlerin kendilerinde gördükleri pedagojik ve içerik bilgi eksiklikleri giderilmeye çalışılmıştır. Bu yönden bakılacak olunursa, proje var olan afet eğitimine farklı bir motif kazandırmıştır. Proje Milli Eğitim Bakanlığı ve JICA işbirliği ile Marmara Bölge'sinde 10 ilde seçilen

okullarda 3 yıl süre ile yürütülmüştür. Ders kitapları analiz edilmiş ve öğretmenlere derslerinde kullanmaları için çeşitli materyaller geliştirilmiştir.

2.1 Araştırmanın Katılımcıları

Araştırmaya katılan okullar amaçlı örnekleme yöntemiyle bir kriter belirlenerek şeçilmiştir. Birinci okul proje kapsamında gerçekleştirilen yarışmalar sonucunda birinci seçilen okullar arasından seçilmiştir. Diğer okul ise projede birinci okulun kontrol okulu olarak proje kapsamında otomatik olarak seçilmiştir.

Araştırmanın katılımcıları, Kocaeli ilinde bulunan A okulundaki 251 öğrenci ve aynı okulda görev yapan 6 öğretmen, ayrıca, yine Kocaeli ilinde yer alan B okulunda okuyan 95 öğrencidir.

2.2 Veri Toplama Tekniği

Araştırma için veriler, araştırmacı tarafından geliştirilen açık uçlu sorulardan oluşan bir öğrenci anket aracılığıyla ve A okulunda görev yapan altı öğretmen ve üç öğrenci ile yarı yapımlandırılmış görüşme tekniği aracılığıyla toplanmıştır.

Ayrıca, araştırma kapsamında araştırmacı bahsi geçen okulda program dışı aktivite olarak neler yapıldığını bire bir gözlemleme fırsatı bulmuştur. Bir gözlem formu hazırlanarak, dikkat çeken hususlar raporlanmıştır. Ayrıca, program dışı etkinliklerle geliştirilen eğitim materyallerinin fotoğrafları da çekilmiştir. Buna ek olarak, proje kapsamında hazırlanan okul dosyası ve hali hazırdaki programda yer alan afet eğitimi ile ilgili bilgi edinmek için ders kitapları da incelenmiştir.

2.3 Verilerin Analizi

Açık uçlu sorulardan oluşan öğrenci anketinden ve yapılan yarı yapılandırılmış görüşmelerden elde edilen nitel veriler, içerik analizi yöntemi kullanılarak analiz edilmiş ve anketteki diğer sorulardan elde edilen nicel veriler ise betimsel istatistik analizine tabi tutulmuştur. Nitel veri analizi sonucu, bazı temalar ve alt grupları oluşturulmuş ve benzer ifadeler gruplandırılmıştır.

2.4 Araştırmanın Sınırlılıkları

Araştırmanın en önemli sınırlılığı bölgenin depreme olan yatkınlığından kaynaklı olarak afet eğitiminin deprem eğitimine indirgenmesidir. Araştırmanın katılımcıları Marmara Bölge'sinde bulunduğu için, yapılan eğitimlerin pek çoğunun deprem eğitimi odaklı olduğu görülmektedir. Fakat, bu demek değildir ki diğer afet türleri için gerekli eğitim göz ardı edilmiştir.

Diğer bir husus ise, veri toplama zamanı ile ilgilidir. Proje üç yıl sürmesine rağmen, araştırmacı verileri projenin ikinci yılında toplamıştır. Bu nedenle katılımcılar bir önceki yılda yaptıkları şeyleri hatırlamakta zorluk çekmişlerdir. Ancak, araştırmacı bütüncül bir yaklaşım elde edebilmek için ve değinilmemiş nokta kalmasın diye verileri birden fazla katılımcı grubundan değişik veri toplama araçları ile toplamıştır.

Ek olarak, araştırma kapsamında öğrencilerin evlerinde afetlere karşı aldıkları önleyici tedbirler sorulmuştur. Öğrencilerin belirttiği şekilde evde alınan tedbirler raporlanmıştır. Ancak, bununla ilgili veriler öğrencilerin bilgileri ışığında elde edilmiştir. Ayrıca, aileler çalışmaya dahil edilmemiştir.

2.5 Araştırmanın Güvenirliliği ve Geçerliliği

Araştırmanın değerini arttırmak için bir takım güvenirlilik ve geçerlilik çalışmaları yapmıştır. Araştırmacı araştırmanın her bir süreci ayrıntılı yansıttığı için daha objektif olmaya çalışmıştır. Araştırmanın güvenirliliğini arttırmak için elde edilen sonuçların hangi şartlar altında ulaşıldığının yansıtılmaya çalışılmıştır. Böylece, benzer çalışmalar yürütecek araştırmacılara daha fazla yol göstermek ve kaynaklık etmek amaçlanmıştır.

Ayrıca, araştırmanın niteliğinin arttırılması için araştırmayı çeşitli yönleriyle incelemeleri için iki uzmandan değerlendirme alınmıştır. Araştırmanın niteliğini arttırmak için yapılan bir diğer yöntem ise verilerin çeşitli yollarla farklı katılımcı gruplarında elde edilmesidir.Araştırma kapsamında, bütüncül bir yaklaşım elde etmek, ve olayı farklı boyutlarıyla ortaya dökmek için birden fazla katılımcı gruptan çeşitli araçlar kullanılarak veriler toplanmıştır.

Araştırmanın sınırlarını ortaya koyma, araştırma içeriğini oluşturmanın bir parçasıdır. Araştırmacı çalışmanın sınırlarını belirleyerek okuyuculara yapılan çalışmayı değerlendirme konusunda yol göstermeyi amaçlamıştır ve böylece araştırmanın niteliği artmıştır.

BULGULAR VE YORUMLAR

Araştırmanın bulgularına göre, programda yer alan afet eğitiminin yanı sıra program dışı etkinliklerle zenginleştirilmiş afet eğitimine katılan öğrencilerde afet konularıyla ilgili farkındalıkları ve bulundukları bölge itibariyle deprem risk algıları daha yüksek çıkmıştır. Bu okuldaki öğrencilerin deprem oluşumunu fiziksel olarak daha başarılı bir şekilde açıklamışlardır. Diğer taraftan, sadece mevcut program kapsamında değinilen afet eğitimi uygulamalarına katılan öğrencilerde depremin oluşumuyla ilgili bilimsel olmayan düşüncelere sahip oldukları ortaya çıkmıştır.

Ayrıca, afet anında uygulanması gereken güvenlik davranışlarını bu öğrenciler daha iyi bilmekte ve depreme karşı evde alınması gereken önlemler konusunda da daha bilinçli oldukları ortaya çıkmıştır. Bu öğrencilerin evinde depreme karşı alınması gereken pek çok temel önlem mevcuttur. Bu da öğrencilerin okulda edindikleri bilgileri aileleriyle paylaştıklarının bir kanıtıdır.

Öğretmenlerden elde edilen bulgular ışığında, etkili bir afet eğitimi için mevcut olan programın yeterli olmadığı belirlenmiştir. Projeden önce öğretmenler yeterli öğretim kaynaklarının olmadığından yakınırken, kendilerini de afet eğitimi uygulayıcısı olarak görmediklerini de vurgulamışlardır. Fakat, program dışı aktivitelerle zenginleştirilmiş afet eğitimi uygulamarı hem öğretmenler hem öğrenciler pek çok şey öğrenmişlerdir ve aktif katılımı esas alan uygulamalarla öğrenilen bilgiler kalıcı hale gelmiştir.

Dahası, öğretmenler afet eğitiminde ailelerin ve diğer bireylerin katılımının önemine dem vurmuşlardır. Afet eğitiminin okulun sınırlarını aşıp bireylerin günlük yaşamlarının bir parçası olması gerektiğini ve bunun da en iyi yolunun sürece ailelerinin de dahil olmasını sağlayacak nitelikte uygulamalar yapılması gerektiği açığa çıkmıştır.

SONUÇ VE ÖNERİLER

Her iki okuldaki öğrencilerin farkındalık düzeyleri arasındaki fark dikkate alındığında, mevcut programın yanı sıra uygulanan destekleyici aktivitelerin afet konularıyla ilgili farkındalık düzeyini arttırmada önemli bir rolü olduğu söylenebilir. Bu sonuç daha once yapılan çalışmalarla desteklenmektedir. Yapılan çalışmalar gösteriyor ki, hali hazırdaki programa ek olarak değişik program dışı aktivitelerle ele alınan afet eğitimi öğrencilerin konuyla ilgili bilgi düzeyini arttırmada, öğrencilerin afet anında ve sonrasında nasıl davranılması gerektiğinin bilmesinde, afet öncesinde hazırlıklı olma konusunda ve onların aileleriyle etkileşimini arttırarak evdeki hazırlık düzeyini de arttırmada etkili olduğu kanıtlanmıştır (Hosseini, ve Izadkhah, 2006; Özmen, 2006; Shaw, Shiwaku, Kobayashi, ve Kobayashi, 2004; Shiwaku, ve Shaw, 2008; Shiwaku, ve Rajip; 2008; Tanaka, 2005). Bu sonuçlar afet eğitiminin risk algısına ve afete hazırlıklı olma davranışlarına etkisi ile açıklanabilir. Mishra ve Suar (2007) yaptıkları çalışmada, afet eğitimi alan kişilerin afetlere karşı daha hazırlıklı oldukları ve onları daha çok risk olarak algıladıkları ortaya çıkmıştır. Bu durumda var olan programın bu anlamda yetersiz kaldığı ve destekleyici aktivitelerin afetlere karşı gerçekçi risk algısı oluşturduğu söylenebilir. Bu sayede de kişiler afetlere karşı daha hazırlıklı olabileceklerdir.

Dikkat çeken diğer bir sonuç ise, sadece programdaki afet eğitimi uygulamalarına katılan öğrenciler afetleri doğal olaylarlar olarak sınırlandırmış ve insan kaynaklı afetleri göz ardı etmişlerdir. Buna karşın, program dışı aktivitlere katılan öğrenciler daha çok insan kaynaklı afetlere de değinmişlerdir. Bu durumda var olan programda insan kaynaklı afet olayları ile ilgili yeterli bilgi bulunmadığı sonucuna varılabilir. Bu da öğrencileri afetlerin sadece doğal kaynaklı olduğu konusunda yanlış anlaşılmalara sevk edebilir.

Ayrıca, çalışma sonucunda öğrencilerin pek çoğunun yaşı itibariyle büyük bir deprem deneyimi yaşamamış olmasına rağmen, afet olaylarını olumsuz algıladıkları ortaya çıkmıştır. Bu durum öğrencilerin medyadan ve ya etraflarındaki afeti yaşamış diğer insanlardan edindikleri bilgiler ile açıklanabilir. Bu tür durumlar kişilerde psikolojik olarak bazı zararlara yol açabilir. Bu da afetlerin engellenebilir olduğu

inancının önüne geçerek kişilerin afetlere karşı hazırklı olma durumunu negatif etkileyebilir. Bazı afet inançları afete karşı hazırlıklı olma davranışını pekiştirirken, bazı inançlar bunun tam tersi yönünde etki edebilir. Literatürde bu çıkarımı destekleyecek çalışmalar mevcuttur (Becker, Paton, Johnston, ve Ronan, 2013; Whitney, Lindell, ve Nyugen, 2004). Örneğin, afetlere karşı yapılacak hiç birşeyin olmadığına inanan kişilerde afetlere karşı hazırlıklı olma davranışı, afetlerin engellenebilir olduğunu inanan kişilere göre daha az oranda görülmektedir. Benzer şekilde, program dışı etkinliklere katılan öğrencilerde afetlere karşı hazırlıklı olma davranışını teşvik edecek inançlar diğer okuldaki öğrencilere göre daha fazladır. Bu durum da, var olan programın bu tür inançları aşılama da yetersiz kaldığı sonucu çıkarılabilir.

Ek olarak, program dışı aktivitelere katılan öğrencilerin büyük çoğunluğu afetlere karşı hazırlıklı olma durumuna karşı kendilerini daha sorumlu hissettiklerini ve bu konuda kendilerini yeterli gördüklerini vurgulamışlardır. Bu sonuç program dışı aktivitelerin bu durumu teşvik edici yönde olduğunu göstermektedir. Ronan ve Johnston (2001, 2003) yaptıkları çalışmanın bulguları ile benzerlik göstermektedir. Yapılan çalışmada, afet eğitimi programları ile afetlerle fiziksel ve duygusal baş etme kapasiteleri arasındaki ilişki incelenmiş, ve çalışmadan elde edilen sonuçlara göre, afet eğitimi almış kişilerde daha gerçekçi risk algısı bulunmakla beraber bu kişilerin afetlerle baş edebilme konusunda yeterli bilgi ve beceriye ve afetlere karşı daha az korkuya sahip oldukları görülmektedir.

Çalışmadan elde edilen diğer bir bulguya göre, program dışı aktivitelere katılan öğrencilerin çoğu afetle ilgili konularda daha fazla bilgiyi internet aracılığıyla elde ederken, diğer okuldaki öğrenciler aile üyelerinden, TV ve gazetelerden bilgi edinmektedirler. Bu sonuç dikkate alındığında, afet eğitimi uygulamalarında öğrencilerin sınıfa gelirken konuyla ilgili bazı kavram yanılgılarıyla gelme ihtimali göz önünde bulundurulmalıdır. Benzer şekilde, Aydın ve Çoşkun (2010) öğretmenlere öğrencilerin sahip olduğu kavram yanılgılarını tespit etmek ve daha bilimsel bilgileri aktarma konusunda büyük bir sorumluluk üstlendiklerini belirtmiştirler. Paralel olarak, öğretmenlerin etkili bir afet eğitimi için yeterli düzeyde pedagojik ve içerik bilgisine sahip olmaları beklenmektedir. Ancak araştırmanın sonuçlarına göre, öğretmenler projeden önce kendilerini bu konuyla

ilgili yeterli görmediklerini ve proje kapsamında gerçekleştirilen eğitimlerle eksiklikleri giderdiklerini vurgulamışlardır. Bu durum, var olan öğretmen eğitimlerinde afet eğitimi yeterli düzeyde ele alınmadığı ortaya çıkarmıştır. Dolayısıyla, öğretmen eğitiminde bu eksikliği gidermek için bazı düzenlemelerin yapılması gereksinimi doğmuştur. Aynı şekilde, materyal eksikliğinden, ekonomik problemlerden gibi problemlerden kaynaklı olarak, öğretmenler projeden önce afet eğitimi ile ilgili konuları anlatırken, daha çok anlatım yöntemi kullandıklarından bahsetmişlerdir. Ancak, afet eğitimi en etkili şekilde öğrencilerin aktif olduğu eğitim ortamında gerçekleşmektedir. Mevcut program bu anlamda da eksik kalmaktadır.

Son olarak, proje kapsamında okulda afetlere karşı bazı yapısal hazırlık önlemleri alınması sağlayacak program dışı aktiviteler de yapılmıştır. Böylece öğretmen ve öğrencilerinafetlere karşı hazırlıklı olma konusunda deneyim kazanmaları için ortam sağlanmıştır. Bu da kişilerin kendilerini afetlere karşı çaresiz hissetmelerini engelleyecek ve kişisel hazırlık davranışlarını tetikleyecektir.

Bu sonuçlara göre, afet eğitimine ilişkin aşağıdaki önerilerde bulunulabilir:

1. İlköğretim programı düzenlenirken, afetlerle ilgili konuların ülkenin jeolojik durumu göz önünde bulundurulmalıdır. Örneğin, depreme yatkın bölgelerde, deprem ve depreme hazırlık konusu daha ayrıntılı öğretilmelidir.
2. Afet eğitimi, ana okulundan itibaren öğrencilerin seviyesine uygun bir şekilde öğretilmeli ve diğer kademelerde de vurgulanmalıdır. Öğrencilere afet eğitimin hayatın bir parçası olduğu aşılanmalıdır.
3. Her okulun bir afet yönetim planı olmalı ve bu plan kapsamında gerekli düzenlemeler yapılmalıdır.Bu planın uygulanabilirliği ve işlevselliği sağlanmalı ve bu plan kapsamında tatbikatlar yapılmalıdır.
4. Afet eğitiminde öğretmenlerin yöntem ve materyal kullanımından kaynaklanan güçlüklerin önlenebilmesi için, konuyla ilgili hizmet içi eğitimler düzenlenmelidir.
5. Eğitim fakültelerinde afetler ve korunma yolları ile ilgili dersler okutulmalıdır.
6. Afet eğitiminde okul sınırlarının dışına çıkıp toplumun her kesimini dahil edecek organizasyonlar düzenlenmelidir.

Araştırmanın sonuçları ışığında başka araştırmalar için aşağıdaki şekilde önerilerde bulunulabilir:

1. Öğrencilerin afetlerle baş edebilme bilgi ve becerilerini geliştirmeyi, afet yönetimini hayatın bir parçası olarak görebilmelerini, ve ileriye dönük afetlere hazırlıklı bir toplum oluşturmayı amaç edinen bir afet eğitimi programı geliştirilebilir.
2. Bu ararştırma ile var olan durumu betimleyici bir şekilde açıklamaya çalışılmıştır. Başka bir araştırma ile öğretmenlerin afet eğitimine bakış açılarını ortaya koyulabilir ve daha geniş bir kapsamda öğretmenlerin sahip oldukları konuyla ilgili bilgi ve tutumları ölçülebilir.
3. Başka bir araştırma ile var olan afet eğitimi programını destekleyecek öğretim modülleri ve materyalleri geliştirilip bunların etkililiğine bakılabilir.
4. Bir diğer araştırma konusu ise öğrencilerin afetlerle baş edebilmeleri için sahip oldukları bilgi ve becerileri ölçmek adına ölçme araçları geliştirilebilir.
5. Öğretmen adaylarının afet eğitimine karşı bakıl açıları ve bu konudaki yeterliliklerini ölçmeyi amaçlayan bir başka araştırma geliştirilebilir.
6. Eğitim fakültelerindeki programlara öğretmen adaylarının afet eğitimi ile ilgili bilgi ve becerilerini geliştirmeyi amaçlayan dersler eklenebilir, çalışmalar düzenlenebilir. Bir diğer çaraştırma kapsamında bu derslerin etkililiği incelenebilir.
7. Öğretmenlerin afet eğitimini etkili bir şekilde verebilmeleri için sahip olmaları gereken içerik ve pedagojik yeterliliklerini geliştirmek adına hizmet içi eğitim seminerleri düzenlenebilir. Başka bir araştırma ile bu seminerlerin etkililiğine bakılabilir.

APPENDIX N: THESIS ACCESS FORM

ENSTİTÜ

Fen Bilimleri Enstitüsü ☐

Sosyal Bilimler Enstitüsü ☐

Uygulamalı Matematik Enstitüsü ☐

Enformatik Enstitüsü ☐

Deniz Bilimleri Enstitüsü ☐

YAZARIN

Soyadı :
Adı :
Bölümü :

TEZİN ADI (İngilizce) :

TEZİN TÜRÜ : Yüksek Lisans ☐ Doktora ☐

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. ☐
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. ☐
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz. ☐

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: