FH Salzburg

Being Prepared for an Earthquake

Increasing earthquake awareness through self-education
&
Mitigating damages occurring in disasters during or after an earthquake

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Eingereicht von: Seza Hande Kurnaz
Immatrikulationsnummer: 1310625009

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Betreut von:

Mag. Dr. Michael Leube
Mag. Arch. Sinan Polvan

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Abstract

Earthquakes are unexpected, far-reaching incidents, which cause severe problems, and thus the society should be informed about being prepared for earthquakes. Although Turkey is under a great risk of earthquake due to its geographical location, it fails about being prepared for earthquake. It was revealed that the problems occurred in 1999 Marmara Earthquake taken as sample upon the researches conducted arouse from the lack of information in the society about earthquake and improper operations of disaster management units. Therefore, ideas to support the damage mitigation and preparedness stages in the country are needed.

As a result of this master's thesis, Be The Next Hero game was designed to increase the earthquake awareness in the society and to make people prepared for an earthquake. This study showed that board games may be used an didactic tool about earthquake. Besides, it was understood that this game designed would help the society to learn the earthquake concept and to assist in damage mitigation and preparedness operations. The product developed as a result of the research shows that using board games as an educational tool, where the earthquake issue may be addressed together with game and education, would favorably affect the learning.

Keywords: Earthquake, 1999 Marmara Earthquake, disaster management, earthquake preparedness, risk reduction, mitigation, game based learning

Kurzzusammenfassung

Erdbeben sind weitreichende Vorfälle, die zu ernsthaften Problemen führen, und daher sollte die Gesellschaft darüber informiert werden, sodass sie auf Erdbeben vorbereitet sind. Obwohl die Türkei wegen ihrer geografischen Lage einem großen Erdbebenrisiko ausgesetzt ist, ist sie nicht auf Erdbeben vorbereitet. Es stellte sich heraus, dass die Probleme, die im Jahr 1999 aufgetreten sind und zwar das Marmara-Erdbeben, das als Beispiel für die durchgeführten Untersuchungen herangezogen wurde, aus dem Mangel an Informationen in der Gesellschaft über Erdbeben und unsachgemäßen Betrieb von Katastrophenschutzeinheiten hervorgingen. Daher sind Ideen zur Unterstützung der Abschwächungs- und Vorbereitungsphasen im Land erforderlich.

Als Ergebnis dieser Master Arbeit wurde das Spiel "Be The Next Hero" entwickelt, um das Bewusstsein für das Erdbeben in der Gesellschaft zu schärfen und die Menschen auf ein Erdbeben vorzubereiten. Diese Studie zeigte, dass Brettspiele ein didaktisches Werkzeug für Erdbeben sein können. Darüber hinaus wurde es entwickelt, um Milderungs- und Vorsorgemaßnahmen zu erleichtern und zu erleichtern. Das Produkt, das als Ergebnis der Forschung entwickelt wurde, zeigt, dass die Verwendung von Brettspielen als pädagogisches Instrument, bei dem sich das Erdbeben mit Spiel und Bildung befassen könnte, das Lernen positiv beeinflussen würde.

Schlüsselwörter: Erdbeben, 1999 Marmara Erdbeben, katastrophenmanagement, erdbebenvorsorge, risikoreduzierung, minderung, spielbasiertes Lernen

Foreword

> *"Whenever we're afraid, it's because we don't know enough. If we understood enough, we would never be afraid. "*
>
> *Earl Nightingale*

Determining the subject of this thesis started with my wish to address any problem in Turkey, the country where I was born and raised. The reason for choosing earthquake among so many other problems is Turkey being unprepared for the next earthquake socially although it is country living under earthquake risk everyday. Actually, instead of being frightened of earthquake, it is possible to mitigate the damages, which occur after earthquake through studies on this matter. I decided to research this matter in depth to develop a project to be able to find a solution to this.

As I plumbed the depths of the matter, there had been times I wanted to quit because of its psychological burden but as I continued I understood how meaningful the matter was and that I made a correct selection. Therefore, I accomplished the research indefatigably and I know that I will continue my studies to expand the borders of this matter beyond this thesis.

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List of Abbreviations

AFAD	Disaster and Emergency Management Authority
AKUT	Search and Rescue Association
ÇADIRKENT	Tent city
DASK	Turkish Natural Catastrophe Insurance Pool
e.g.	lat. exempli gratia = English for example
etc.	lat. et cetera = English and so on
FEMA	Federal Emergency Management Agency
KIZILAY	Turkish Red Crescent Society
PTSD	Post traumatic stress disorder

I Introduction

In this chapter of the research, the problems to be focused, which occur after the earthquakes, will be explained with their justification to give a general point of view to the reader about the research. Then, the assumptions directing the research are set forth by mentioning the purpose of the research and why it is important. At last, the restrictions in the research are explained and the methodology and the structure of the research are described.

1 Problem Status

Turkey is a country, which is constantly face to face with earthquake due to its geological location. There occurred many tangible and intangible losses in the country as a result of earthquakes during the last 58 years. Within this context, it is very important that the disaster management units, which work to mitigate the losses, fulfill their tasks properly.

A poor disaster management also causes the failure to manage the chaos that occurs after the earthquake. Especially the crisis situation that occurred after 1999 Marmara Earthquake could not be recovered and caused many problems to occur due to the lack of an effective management plan. Disaster management units, which exhibited a poor operation during 1999 Marmara Earthquake, are today conducting studies to avoid the recurrence of the problems, but it seems that these studies does not exactly assure those who lived through the earthquake. This is because the actions taken regarding the earthquake these days are generally related to solving the problems encountered in engineering area and the human needs are of secondary importance.

The society being unprepared for the earthquake and their failure to get enough information on earthquake indicate that they are not prepared for an earthquake. Within this context, when the mitigation studies conducted on earthquake in Turkey are reviewed, it is seen that there are no activities other than the brief conferences held for raising the society's awareness on earthquake, conversations and the earthquake drills performed from time to time. It is understood that there is a need for new methods and techniques in education to develop an earthquake understanding in the society and to make the society live prepared for a possible earthquake. In this case, it is a mystery whether the bitter incidents experienced in 1999 Marmara Earthquake will reoccur in the next earthquake. With the population of Turkey increasing day-by-day, it is obvious that the activities of the disaster management agencies for damage mitigation would fail. Therefore, there is a need for ideas to help the society to become aware by itself and to educate itself.

2 Problem

Analyzing the awareness of the society living in Turkey, which is under earthquake risk due to its geographical location, in face of an earthquake, and its capacity to cope with problems.

3 Aim of the Research

Turkey is one of the countries, which have the highest earthquake risk and which are affected the most by the damages of the earthquake. Therefore, many social, economic and psychological problems occurred after each earthquake. It is possible to say upon the research conducted that these problems occurred after 1999 Marmara Earthquake.

The primary goal of the research is to analyze how did the disaster management processes handled after 1999 Marmara Earthquake, which is taken as the sample incident, and to determine what were the problems occurred. Besides, it is intended to designate whether there are studies conducted on these problems today, and if not, to determine what kind of solutions would be beneficial. It is important to review this process for the society to overcome the possible earthquakes in the future with less damage and to solve the problems that come together with earthquake.

The awareness of the society of the risk, its capacity to cope with problems, determining its perception and interpretation of the earthquake may be used as strong data in the studies to mitigate damage in earthquake. For this reason, it is important to reveal whether there is a significant relation between earthquake perception and interpretation processes and become informed about precautions against disasters and earthquake in terms of preparing the society against earthquake through the product to be designed at the end of the research.

Another purpose of the research is to investigate the problems occurred in 1999 Marmara Earthquake and to have the product designed about earthquake for damage mitigation affect the earthquake perception of children and their parents favorably and to contribute in education on earthquake. Therefore it is of significance to understand how the masses affected by the earthquake and the children who never experienced earthquake perceive earthquake and how this perception influence their lives. For the product intended to be designed as a result of the research to be helpful, practical and meaningful for the user, it is planned to review the data obtained in detail by considering the opinions and expectations of the society.
This research was conducted to create a product which may be beneficial with regards to allow the society to educate itself on earthquake without feeling a need for external help in the context of problems occurred in 1999 Marmara Earthquake.

4 Importance of the Research

The society being unprepared for disasters due to lack of information shows that they become helpless under risks like earthquake. In consequence, this study is important in showing that lack of information lies behind the problems occurred after the earthquake and that solution oriented studies need to be conducted in this area.

It was understood that this game designed at the end of the research would help the society to learn the earthquake concept and to assist in damage mitigation and preparedness operations. Although there are many didactic products designed and many activities performed in Turkey, unfortunately there are no studies conducted on such an important and dangerous issue like earthquake. As a result of the researches conducted within this context, Be The Next Hero board game, which is designed to fulfill the lack of information about earthquake in the society, is important in terms of diversifying the didactic board game studies in the future, keeping the important topics like earthquake on the agenda and contributing to educational studies on this matter.

5 Hypotheses

For the research to guide the theoretical and empirical studies to be conducted upon the determination of the problem, some hypotheses were made. These hypotheses are:

H1 People living in Istanbul which is under earthquake risk are not prepared for a possible earthquake.
H2 During earthquake, individuals act according to their emotional motives and reflexes.
H3 There is a relation between the proper planning of disaster management and the society feeling secure.
H4 The biggest needs after the earthquake are the pre-determined assembly areas and being prepared for a possible earthquake.
H5 People are afraid of earthquake because they do not have enough information about the issue.
H6 There is a connection between parents with insufficient information about earthquake and their children unprepared for an earthquake and afraid of earthquake.
H7 There is a relation between not caring enough to earthquake education in schools and the knowledge of students about earthquake.

These hypotheses determined were cleared as a result of intensifying the research, which progresses with an induction approach.

6 Limitations of the Research

This research of which the subject matter is the problems occur after earthquakes and the sociological dimension of 1999 Marmara Earthquake has various restrictions in order to conduct the research in a healthy manner within the bounds of possibility. In general, these restrictions are as follows.

The "interview" data of the empirical research section are restricted to the earthquake victims constituting the sample group who reside in İzmit and who were affected by 1999 Marmara Earthquake.

The "survey" data of the empirical research section are restricted to the fourteen volunteer 7th grade students who constitute the sample group and who are studying at Ahmet Şimşek Secondary School in Kadıköy, Istanbul.

"Usability test" data of the product development section are restricted to the twenty volunteer 5th grade students and their class teacher at Private Taş Primary School in Bakırköy, Istanbul and they constitute the sample group.

Finally, this research is restricted with the local and foreign resources available.

7 Methodology and Structure

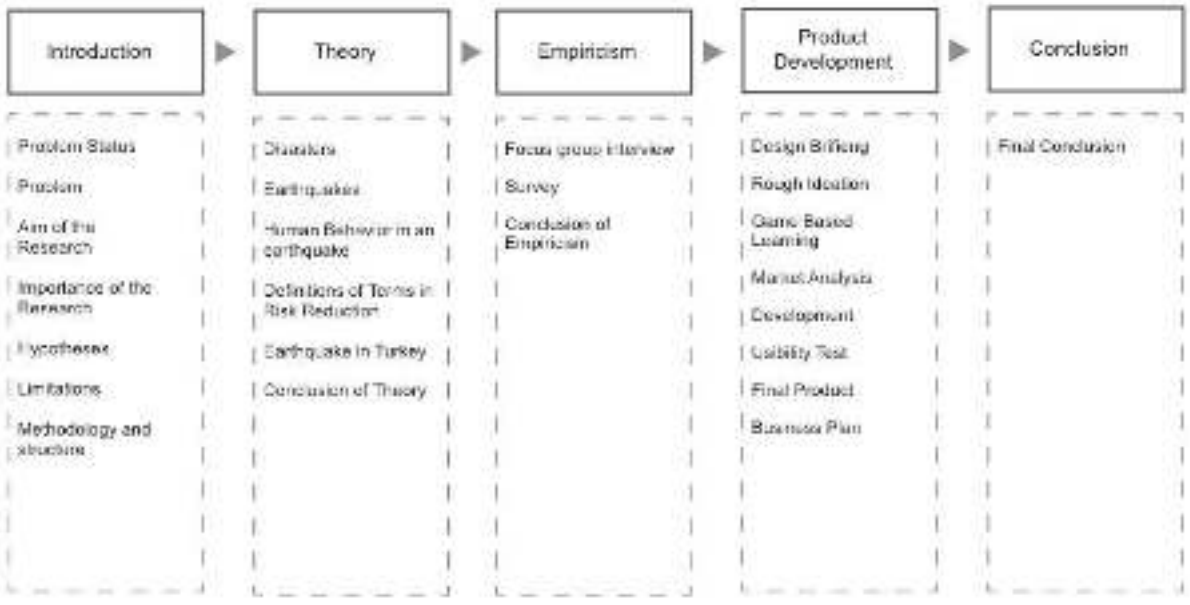

Figure 1: The thesis' structure (Own Figure)

As shown in the figure above, the research consists of five general chapters. The first chapter includes the problem, objectives, importance, restrictions, methodology and the structure of the research.

The second chapter the covers the research on the problems aroused after the earthquakes by analyzing the earthquakes occurred in the world and in Turkey. Under the Theory title, a detailed and in depth research about the earthquake and its effects, disaster management, 1999 Marmara Earthquake and preparations towards an earthquake are addressed. This literature search constitutes the basis of the empirical research.

In the third chapter of the thesis, the empirical studies which involve the population and the sample of the analysis, the method and data analysis processes are given. The researcher reached the data intended to be obtained from the empirical studies through the interviews held with earthquake victims who lived through the 1999 Marmara Earthquake at the very center and through the surveys conducted to determine the earthquake perception of the children who had never experienced earthquake. In the empirical studies conducted, it was intended to establish a cause and effect relationship based on the theory chapter.

In the fourth chapter, the product designed with the data obtained at the end of the researches conducted by the researcher is shown. In this chapter, the whole development process of the product is given. Design briefing, ideation stage and the final product are addressed in this chapter. This chapter is finalized with a business plan prepared for the product built and the last chapter begins.

The fifth and the last chapter presents the outcomes and the recommendations related to the entire study.

II Theory

8 Disasters

Disasters are the incidents that cause loss of life and property in the whole society or a part of it as a result of natural or human-induced events. Disasters that lead to physical, economic and social losses in the society are the facts that drag the said society into uncertainty. Millions of people in the world die or become permanently disabled due to disasters. Societies experience great losses in parallel with this. Different types of disasters occur all over the world (cf. Bilik 2015, 10).

There are some factors that trigger the great disasters. These factors are:

- *"Physical magnitude of the incident,*
- *Distance of the incident to the residential area,*
- *Poverty and underdevelopment,*
- *Rapid increase of population,*
- *Rapid and uncontrolled urbanization and industrialization in dangerous regions,*
- *Destruction or misuse of the forests and the environment,*
- *Ignorance and lack of education,*
- *Level of the protective and preventive measures, which the society might taken against disasters in advance" (Ergünay 2002, 48).*

The first two of these factors are natural and the rest of the factors are human induced.

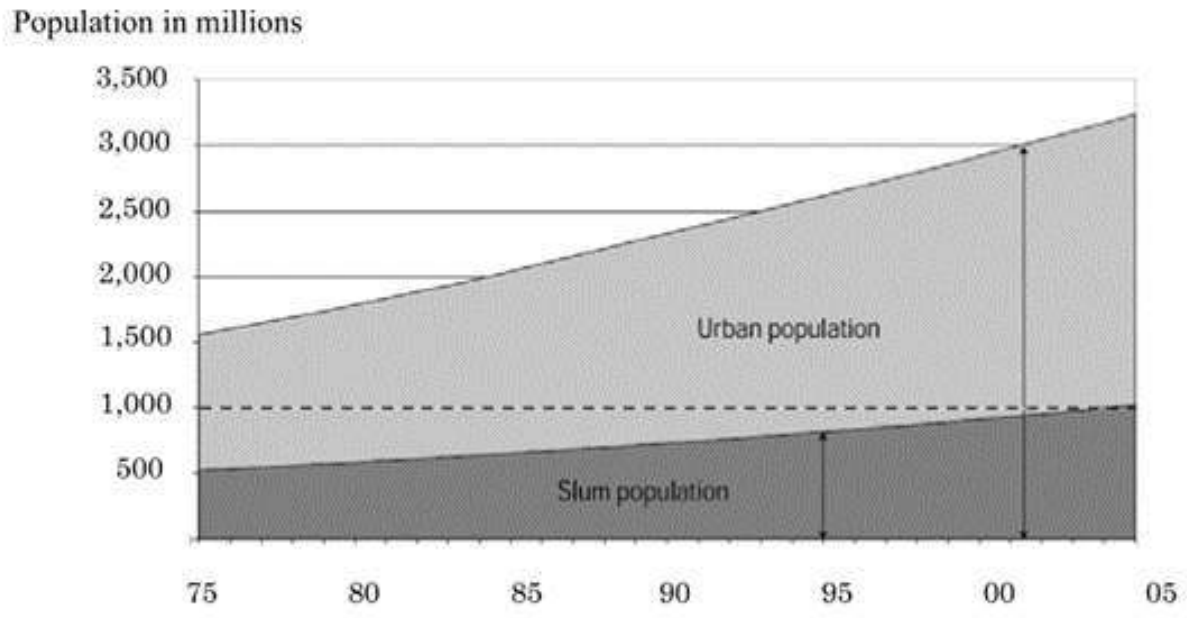

Figure 2: World Population Trend (UN-HABITAT, 2011)

As it is seen in Figure 2, there is a continuous increase in the population of the world. Therefore, many changes are made in the nature to fulfill the residential needs of people. The disaster risk increases with the rapidly increasing population.

When Poverty and underdevelopment, which is another human-induced problem, is considered, it is seen that developed countries may overcome disasters more easily. As it is given in Table 1, people died of disasters are more in poor countries or in countries with higher population (cf. Sarı 2011, 2).

Rank	Event	Location	Date	Death toll
1.	1931 China floods	China	Nov. 1931	1m–2.5m
2.	1970 Bhola cyclone	Bangladesh	Nov. 1970	500,000
3.	2010 Haiti earthquake	Haiti	January 2010	300,000+
4.	1976 Tangshan earthquake	China	July 1976	300,000
5.	1920 Haiyuan earthquake	China	Dec. 1920	234,000
6.	2004 Indian Ocean Tsunami	Indonesia	Dec. 2004	230,000+
7.	1923 Great Kanto earthquake	Japan	Sept. 1923	142,000
8.	Cyclone Nargis	Myanmar	May 2008	138,000+
9.	1991 Bangladesh cyclone	Bangladesh	April 1991	138,000
10.	1948 Ashgabat earthquake	Turkmenistan	Oct. 1948	120,000

Table 1: Ten deadliest natural disasters in 20th century (Sarı 2011, 2)

Natural disasters may be divided into two as creeping disasters and sudden-onset disasters. The creeping disasters are those, which occur in time like drought, narrowing of the forests, severe colds. The sudden-onset disasters happen unexpectedly like earthquake, flood, hurricane, volcano and fire.

Human-induced disasters are not directly connected with the nature, but result from human factors. Nuclear and chemical accidents, accidents due to overpopulation and migrations may be given as an example to these disasters (cf. Bilik 2015, 12).

8.1 Earthquakes

8.1.1 Definition of Earthquake

> *"Earthquakes are the short-term shaking and trembling of the earth due to natural factors which may usually cause significant changes on the surface" (Bilik 2015,13)[1].*

In other words,

> *"Earthquake is the shaking of the environments through the surges of vibrations that occur suddenly as a result of the breaking of earth crust" (İşçi 2008, 959)[2].*

Earthquake is an unavoidable natural event and its primary characteristic is its sudden occurrence. It is generally caused by the breaking due to tectonic (from the interior of the earth) movements. Earthquakes are divided into three according to their causes. These are:

- Tectonic Earthquakes
- Volcanic Earthquakes
- Collapse Earthquakes

Earthquakes caused by the slip of the plate movements are called tectonic earthquakes. Tectonic earthquakes, which are known to be the most common earthquake type, cover 90% of the earth. While the earthquakes occur as a result of volcanic eruption is called volcanic earthquakes, the earthquakes as a result of a collapse on the earth rust are collapse earthquakes (cf. Öztekin 2001, 7).

Due to its impacts, earthquakes may lead to social problems as it impairs the daily function in the society and the order of the society. By deeply affecting the lives of people, earthquakes may create a need to new order in the society (cf. Kasapoğlu, Ecevit 2001, 9).

8.1.2 Earthquakes in the World

Great earthquakes occur throughout the world almost every year. It is not possible to definitely forecast when and where an earthquake, which is the leading sudden-onset disaster, will occur. Therefore, great losses of life and property occur in the region following the earthquake. The loss of life varies depending of the time of the earthquake. As a result of the researches conducted, it is seen that approximately 1,600,000 people lost their lives in 20th century and that there had been great economic losses (Bilik 2015, 15; Şahin, Sipahioğlu 2009, 39).

[1] translation by the author
[2] translation by the author

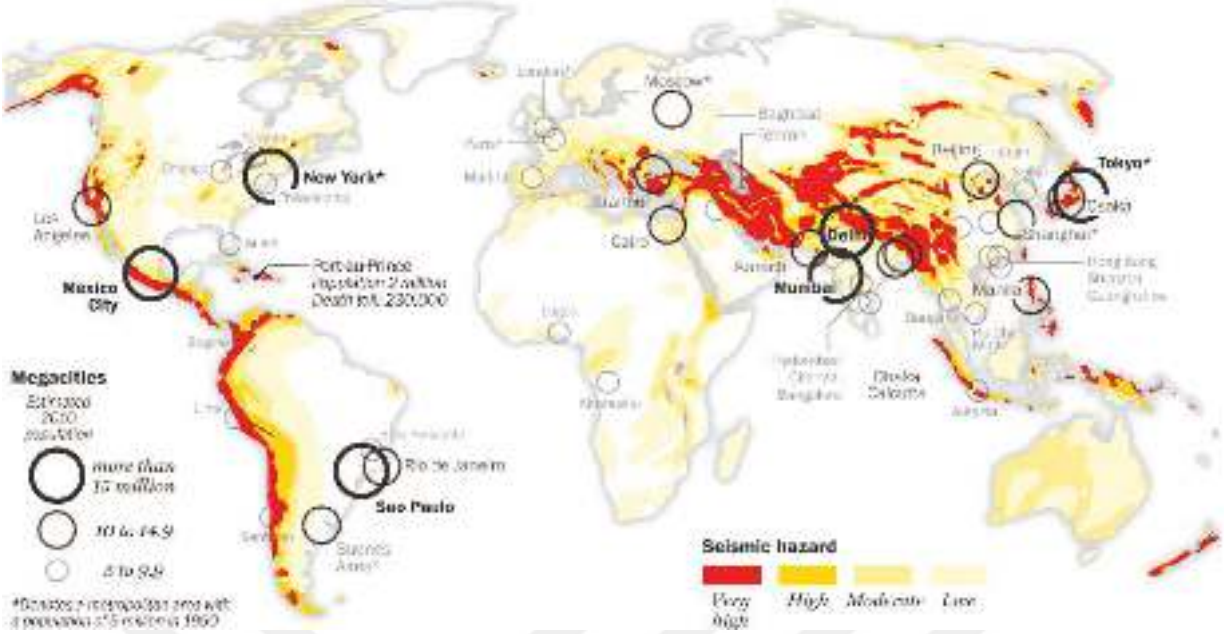

Figure 3: This map shows where the strongest earthquakes are expected to strike and population of the megacities (Washingtonpost, online)[3]

We can say that the unfavorable effects of the earthquakes will continue in the future as they were in the past. Increasing population density and unpreparedness of these cities against the risk of earthquake may lead to great losses by the earthquakes. This map shows where the strongest earthquakes are expected to strike. As on this map, earthquakes center on three main belts. These are:

- *"Pacific Earthquake Belt: 81% of the earthquakes occur on this belt. This region covers Southern American coasts from Chile, Central America, Mexico, western coasts of USA, and Aleutian Islands, Japan, Philippines, New Guinea, Southern Pacific Islands and New Zealand starting from the south of Alaska.*
- *Alpine-Himalayan (Mediterranean) Earthquake Belt: 17% of the earthquakes occur on this belt. It is around 12000 km long starting from Spain and extending to Himalaya Mountains and China over France, North Africa, Italy, Greece, Turkey, the Caspian Sea, Iran and Afghanistan.*
- *Atlantic Region: This belt extends across the Atlantic ridge" (Bilik 2015, 14; Şahin, Sipahioğlu 2009, 39).*

Earthquakes are one of the most frightening and devastating natural events. As they are sudden, it may take months or even years to correct the devastation left behind. The size of the devastation may be associated with the intensity of the earthquake. The more intense the earthquake, the more severe the problems, devastations and accidents in the city are.

[3] http://www.washingtonpost.com/wp-dyn/content/graphic/2010/02/23/GR2010022301120.html

Descriptor	Magnitude	Average Annually
Great	8 and higher	1 [1]
Major	7 - 7.9	15 [1]
Strong	6 - 6.9	134 [2]
Moderate	5 - 5.9	1,319 [2]
Light	4 - 4.9	13
Minor	3 - 3.9	130
Very Minor	2 - 2.9	1,300,000

[1] Based on observations since 1900

[2] Based on observations since 1990.

Table 2: Frequency of Occurrence of Earthquakes (USGS 2004; Sarı 2011)

According to this table, it is seen that the devastation caused by a 3rd grade earthquake may be smaller than those caused by 6th or higher grade earthquakes. The most intense earthquake in the world was recorded in 1969 in Alaska Earthquake with 9.25 and in 1960 in Chile Earthquake as 9.5. In Chile Earthquake 655 people lost their lives and thousands of people got injured. The earthquake caused a damage of 550 million USD. Following the Alaska earthquake that lasted 3 minutes 128 people lost their lives and there was a damage of 310 million USD (cf. UNDP 1992).

8.1.3 Disaster Management

Disaster management is a management process for the prevention of disasters and minimizing damages, being prepared for disasters, i.e. proper planning before, during and after disaster and good leading. (cf. Ergünay, Gülkan, Güler 2008, 328)

It covers the risk and crisis management implemented in the period between two disasters occurred. Societies with disaster experience conducted extensive studies on disaster management to solve the problems emerged. The disaster management models generated were recommended by the authorities to minimize the damages which may occur. Disaster management is a continuous fact; it is not an abrupt method. (cf. Bilik 2015, 33f)

In a disaster management system where each stage is carefully addressed, prevention of disasters and minimizing its damages are emphasized. Besides, this system highlights the importance of social awareness and considers involving individuals, non-

governmental organizations and every department of the government in the process. This process consists of 3 stages.

1. Pre-Disaster: At this stage, it is aimed to determine the risks causing the disaster and to take measures against these risks.
2. During Disaster: During this period, human rescue practices are very important, and it is targeted to make a good planning to ensure safety, provide temporary sheltering measures and to fulfill the basic needs.
3. Post-Disaster: The shock, fear and panic experienced after a disaster may last long. The purpose here is to compensate the losses and re-strengthen the society. (cf. Bilik 2015, 35f)

The mentioned disaster management system is a process regulated under two phases which are risk management and crisis management.

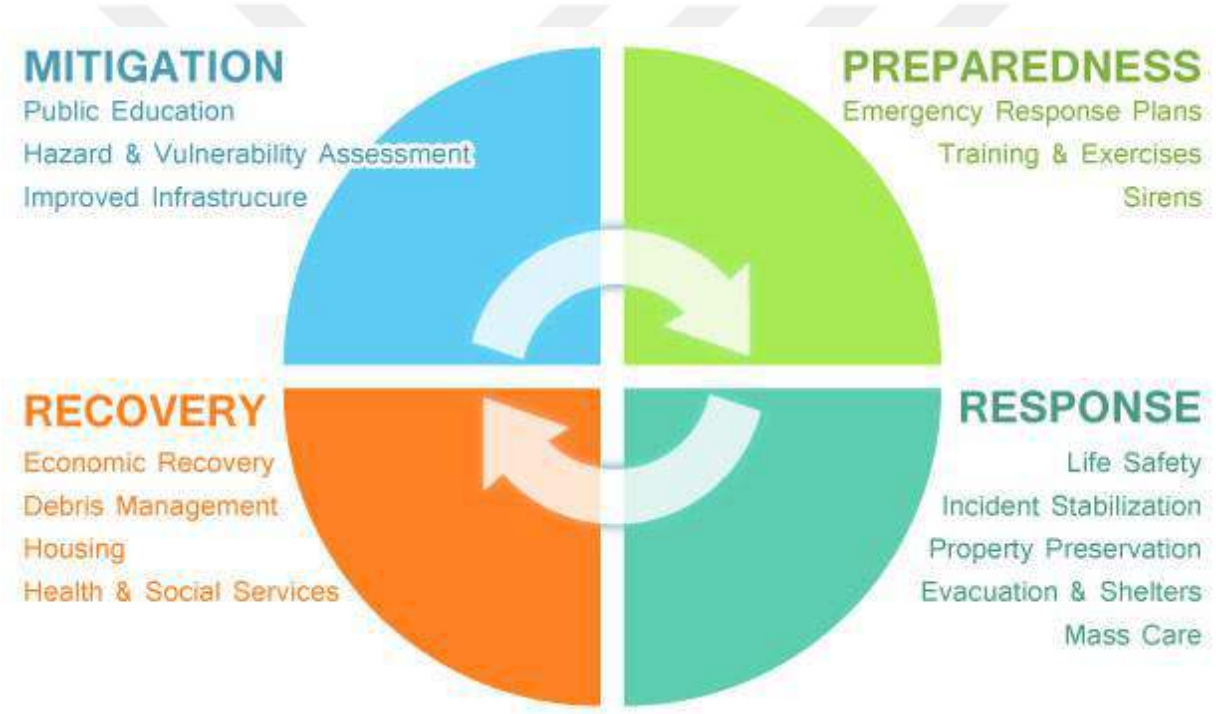

Figure 4: A graphic representation of the four phases in emergency management (online)[4]

Risk Management

Risk management focuses on determining the dangers and risks before the earthquake and covers the preparations of disaster scenarios that may happen in the future. This process covers risk and damage mitigation, and preparation steps. Through the strategic plans prepared in during this period, it is intended to minimize the problems that may be caused by the earthquake (cf. Ergünay, Gülkan, Güler 2008, 331).

[4]http://www.villageofbellevue.org/departments/public_safety/fire_and_rescue_department/emergency_management

- **Mitigation**

Mitigation is the damage minimization stage and continues until a new disaster occurs. The purpose is to minimize the risks that may turn into a disaster and to strengthen the infrastructure of the city (e.g. infrastructure, building, road, bridge, etc.).

Mitigation is the most cost-effective method to minimize the effect of the dangers, however this is not always suitable. Mitigation also covers evacuation decisions and there may be many individuals who do not want to abide by the decision. In this case, practices like mandatory evacuation to minimize the risks are applied (cf. Sarı 2011, 10).

As the risk grows, the urgency of mitigation and preparedness works also increases.

- **Preparedness**

This is the process where actions are taken against the current pre-disaster risks and preparations are made. Although it is not always possible to prevent the disasters through preventive measures, the risks may be mitigated through these measures. Early warning systems, taking precautions, rescue-evacuation, emergency aid plans and trainings are the most significant practices in this step (cf. Bilik 2015, 38).

Crisis Management

Crisis is "all the risks related to physical, social and economic reasons which disturb the normal order and with potential to lead unfavorable outcomes for the society" (cf. Ergünay 2008).

Crisis management refers to the period after the disaster. Crisis management is a temporary procedure, which aims to normalize the situation disturbed due to the problems encountered. This procedure covers response and recovery steps.

- **Response**

This is the step that covers fast and on-site responses. The most important purpose of this step is to keep communication and transportation networks available, to manage the processes at the crisis moment like first aid and evacuation, and to fulfill the basic needs (cf. Bilik 2015, 39). In addition to this, it is important to prevent secondary disasters like evacuation, temporary housing, environment health, loss assessment, security, fires and diseases (cf. Özkan 2003).

- **Recovery**

This is the step for resolving the problems, binding up the wounds and providing support for those in need after the disaster. In this step, recovery works for physical and psycho-

logical rehabilitation are prioritized. The purpose is to re-order the daily life conditions. To reinforce the city by arranging the needs like road, water, communication is the basic characteristics of this step. Recovery period may vary depending on the severity of the damage occurred and the size of the losses after the disaster. The studies conducted intend to prevent experiencing the agony and the ravage following the disaster once again. (cf. Kadıoğlu 2008, 10)

As a result, the main components of disaster management consist of two stages which are risk management and crisis management. This management conducts pre-disaster studies aiming the mitigation of the losses and damages, early warning, response, recovery and restructuring as well as minimization of the damages from the disasters. (cf. Kadıoğlu 2008, 10).

8.2 Human Behavior in an Earthquake

8.2.1 Psyhcological Effects of Earthquake

Earthquakes lead to many psychological problems as well as the physical damages it leaves behind. These psychological problems are caused by the unexpected changes in their lives. It is not easy to accept such a rapid change. Therefore, it should not be anticipated from a normal person to forget all the unfavorable incidents experienced and get back to his/her life immediately. The traumatic situation occurs accordingly may not be ignored (cf. İşmen 2006, 350).

People may go through a trauma as a result of the incidents like disasters, physical or sexual assault, loss of someone close, loss of work or witnessing a terrifying event (cf. Everstine, Everstine 1993). Traumatic events may vary depending on the age of the person, the severity of the incident, social values, exposure and past experiences (cf. Nakajima 2012, 150). Thus, response of each people to experiences and their acceptance of events are different. While one of two people who experienced the same incident go through a trauma, the other one may continue his/her life without being affected (cf. Gershuny, Thayer 1999).

A natural disaster is known as the precursor of a second and many more traumas which may occur afterwards. This circumstance is named as "domino effect". So, the fires, losses and accidents following an earthquake disaster may be examples to this effect (cf. İşmen 2006,351).

It was observed that among the psychological reactions that occur after an earthquake, fear is the most intense feeling experienced. A person may live through this fear intensely with the thought that past experiences would reoccur and with a concern about future (cf. İşmen 2006, 353). As well as fear, other strong feelings like guilt, anger and sorrow may be observed and such feelings may cause a trauma by continuously refre-

shing. The symptoms of this trauma in the inner world of a person may sometimes disappear within a short period or last for months or even years (cf. Nakajima 2012, 151).

According to some researches, when the psychological effects of earthquake are considered, anger and depressed feelings were seen. It was determined that people hide their anger in order not to reflect to their children, but that the anger was directed to other people after some time. It was noticed that parents became unable to control their anger by covering what happened instead of talking about earthquake with their children. Besides, it was detected that this situation led to problems like alcohol consumption, suicide, envy, hostility, passiveness, despair and careless driving (cf. İşmen 2006, 351).

It was also observed that some people had unrealistic expectations and moved away from solving the existing problems. It was revealed that in such a case, feelings of pessimism and despair dominated. People mentioned that consuming alcohol instead of getting a psychological support facilitated their lives, they forgot their pain a little thanks to alcohol and that they could sleep easier. Also, some people felt sorry for those people who died and guilty because of being alive, and some other thought of their losses and blamed those who knew them and survived because they didn't die (cf. İşmen 2006, 352).

The approach of people towards earthquake is directly proportional to their knowledge on the matter. While some people accept that earthquake is a natural disaster, others take this a the punishment of God. This is defined as "distortion" (cf. İşmen 2006, p:353). The ignorance occurs in this case also leads the psychological problems to grow further.

8.2.2 Earthquake and Human Behavior

> *"Earthquake is the disappearance of past and the uncertainty of future (Erdoğan 2007, 1).*[5]

The effects of disasters, especially the earthquake, on the society may last for months or years. Besides loss of life and property, earthquakes affect our daily lives and may lead our social lives to change. The attitude of overcoming earthquake is different in each individual. In particular, there are great differences between the adults and children and youngsters in terms of the degree of the effect. According to the scientific researches, children and youngsters are affected by the traumatic incidents like earthquakes much more than the adults (cf. Pfefferbaum 1997; Richards, Bales 1998).

[5] translation by the author.

Earthquake Behavior of Adults

Today, perspective of societies towards disasters has changed thanks to experience and education. In early XIXth century, people approached with the same perspective as they had for diseases. Now it is understood that disasters may be overcome with minimum damage by taking the necessary precautions and getting the required education (cf. Yılmaz 2012, 62). This enables adults to take earthquake more naturally. Unlike children, adults are aware of the real world and the dangers that may occur.

Earthquake, which is a natural disaster, caused "emotional, behavioral and cognitive" problems in adults. The most intense psychological state is called as "post-traumatic stress disorder" (PTSD) (cf. Karancı 2003, 4f). It is observed that PTSD is induced by feelings like anxiety, unhappiness and depression. Feelings of despair and insufficiency experienced after earthquake may increase the severity of depression. Successive problems and failures may also lead to the loss of safety feeling. Therefore, individuals may avoid from making new decisions and taking steps. It is observed that they think they take themselves under protection by this way (cf. Erdoğan 2007, 6).

It was seen that parents did not care about their health very much, but they focused only on their children. A parent who is not fully healthy physically and psychologically would not be able to help his/her child. This is because the physical and psychological health of the children depends on their parent’s health (cf. Erdogan 2007, 7).

After the disasters, "unrealistic optimism" is observed in some people. As one never do evil, he/she does not think he/she would not experience any evil. So when such an evil occurs, he/she could not understand how it happens. In incidents like earthquake, people learn that they may not actually control what will happen. This changes how they see the world (cf. İşmen 2006, 354).

Some adults quite panic in emergencies and at moments of danger. This may lead to personality change. Therefore, they may make irrational or wrong decisions (cf. Jain, Bansal, Matela 2005, 3).

Decisions made in emergencies differ from the other decisions made in daily life. One of the reasons that cause this is the emerging feeling like stake. In this case, deciding what is the priority may take some time. Secondly, while making a decision it is important to make use of time well. One does not want to misevaluate an important and a critical situation. Finally, decisions made in uncertain, incomplete and unordinary situation may force a person (cf. Proulx, 2002 ,1ff).

According to some researches, it was presented that psychological disorders seen in earthquake victims were higher in those who were not earthquake victims. Major depression and adjustment disorders in an earthquake victim are more severe than in a person who is not an earthquake victim (cf. Bacanlı, Ercan 2006, 8). It was seen that the negati-

ve effect of earthquake on an individual's mental status caused the problem to last for years. Although the studies conducted to solve these problems revealed positive outcomes, it is observed that some earthquake victims still experienced psychological problems despite the long time passed, that they avoided the situation-reminding earthquake and that even they didn't want to go home.

People experiencing traumatic incidents face their own vulnerability. Fear of death may occur in such people whose sense of safety is damaged. This may increase their anxiety. Thinking that they are far from protection may make it difficult to overcome the traumatic period. According to İşmen (2006), although it is hard for an individual to adapt the recovery period after a trauma, it is seen that two processes are effective in this period. These are "automatic and cognitive processes" (cf. İşmen 2006, 355).

In "Automatic Processes", the organism kind of turns into itself in order to recover and to change emotionally and mentally. During this recovery, "emotional numbing" and "cognitive denial" are observed. This is also defined as "denial numbness" (cf. İşmen, 2006). While emotional numbing is referred as the loss of feelings by some individuals, this protects the individual from excessive anxiety.

In the cognitive process, a person tries to understand the traumatic incidence experienced and begins to re-assess what happened. In this process, feelings like self-accusation occur. Such feelings that facilitate overcoming traumatic incidents are seen to help in taking lessons from disasters like earthquake (cf. İşmen 2006, 356). We can thus see that the importances of interpersonal relations increase.

Earthquake Behavior of Kids

Children are frightened of earthquake as much as adults and they establish the feeling of safety over their families. They are aware of their weakness and insufficiency, and they have difficulties in understanding that earthquake is beyond control. Therefore, it is normal that children get more frayed psychologically than adults (cf. Erdogan 2007, 2).

As a result of damaged self-esteem and safety feelings after earthquake, fear and stress induced trauma are observed in children. Following an earthquake, children become aware of the insufficiency of their parents who they considered as hero and may fear even more. Because they understand that their families where they feel themselves safe also need protection. That is why children are affected more by earthquake (cf. Erdogan 2007, 2).

Acute stress reaction and post-traumatic stress disorder are the first symptoms observed after earthquake. These disorders are very common after trauma (cf. Erdogan 2007, 3).

As the child is not mentally and physically ready for an earthquake, it should be known that trauma experienced after earthquake is different than the stresses he/she had befo-

re. While for some children it is hard to get over this trauma, others are not concerned about any problems that may happen after earthquake but may worry about losing an object important for him/her. In this case, it is seen that the responses of children to earthquake experience are different and one of the greatest factors that affect this difference is age.

Infant Period (0-1 year)

Infants are not directly affected from the earthquake; what they feel is associated with the mother's experience. As mother's feelings like anxiety, fear and stress would affect her care for her baby, the baby is indirectly affected by this. Therefore, outcomes like excessive crying, sleeplessness and having difficulties in showing socially expected first reactions might be detected (cf. Gür 2011).

Pre-School (2-5 years)

Children in this period have difficulties in overcoming the outcomes of earthquake. They need the support of their families and teachers. It is hard for children of these ages to understand what they feel after the natural disaster and what happened. Besides, they may not express their feelings with words (cf. Brooks, Spiegel 1996, 5). During this period, behaviors like crying, loss of appetite, nyctophobia, nervousness, sensibility against high voices, piss himself/herself, constantly being with parents may be observed in children. Therefore, children in this period should be taken care more intensely (cf. İşmen 2002, 84).

School Age (6-11 years)

Children at these ages have the perspective to notice real incidents. So they are aware of the dangers and they may present infant-like behaviors because they are afraid to be alone (cf. Godon 1999, 113; Brooks 1996, 76; İşmen 2002, 85). Although the parents don't want to talk to them about the earthquake and make them go through the same things again, children at this period may get information from the papers and the news. Thus, it is very important for families to be in communication with their children. Besides, clearly explaining the incident instead of hiding helps preventing the problems which may occur in this period.

After the earthquake children may be more nervous and aggressive. Besides, they may be unsuccessful in the school and want to quit, or they may have new tics and fears (cf. Gordon 1999, 113f ; İşmen 2002, 85).

Puberty (12-18 years)

In this age group, relations with friends as well as family are very important. Someone who is not accepted among his/her friends may turn in on himself/herself and such peop-

le may exhibit signs of depression. In this period, individuals may show reactions like anxiety, tension or defiance. Some adolescents might have encountered injured or dead people by participating rescue operations during the earthquake. This might have left a trace, which is hard to forget, and most of the time they might have been unable to express their feelings. Anger and guilt are the most common feelings observed in such chaos (cf. Gür 2011).

Besides the age factor, even if the child is not directly affected from the earthquake, he/she may be affected by the behaviors of the family after the earthquake. Anxious and fearful behaviors of the family members may betray the child's trust against the family and the life. In the meantime, if the child losses a relative in the earthquake, he/she may be greatly affected by this and bond to his/her family far more. One of the reasons leading to this is observed to be the fear of being left alone. Besides, the lack of information about earthquake and about what to do afterwards disturb them and reveal feelings of despair and insufficiency. In this period, children's need for their families are at the maximum level (cf. İşmen 2002, 82f).

These problems which may continue for several months after earthquake are known to be normal reactions. Erdoğan sorted this psychological trauma stage as follows:

1. Shock and surprise period
2. Avoidance and protection period
3. Confrontation and re-evaluation period
4. Recovery and adaptation period (cf. Erdoğan 2007, 2).

Denial is the most significant impact of the shock and surprise period. Disregarding the incident like nothing happened and no losses incurred is associated with the severity of the trauma. Denial mechanism ends when the person confronts the situation. Some people tell the incident as if it was not important. This is not only observed in children but also in adults. Being alert at all times, anxiety, breaking off the relation with places reminding the incident may be examples for avoidance and protection period. Attention, anger problem, aggressiveness are observed in confrontation and re-evaluation period. Operations after the earthquake and the recovery period are now our area of movement. Thanks to the measures taken and the studies about earthquake, it is seen that the adaptation period has passed and recovery period started. Of course, this might change for every individual (cf. Erdoğan 2007, 2ff).

One of the issues which the families should be careful about is the child's expectation of further attention following such traumatic incidents. If there are findings like uneasy or infantile behaviors, problems in the school, decrease in desire to play, turn in on oneself and sleeping disorder, these should be considered and a special attention should be given to the children (cf. Nakajima 2012, 153).

Children may worry that the earthquake would reoccur and they would go through this period again. The idea of everything blowing up again may disturb. Especially the children experiencing a trauma may not easily erase this from their minds (cf. İşmen 2002, 86).
After the earthquake, children would like to share their feelings and if there are no proper medium and people to share, the "repression mechanism" becomes active and this may lead to problems we may face in the future (Erdoğan 2007, 5).

Children may worry for themselves and for their families after the earthquake. They may be afraid of sudden changes and voices. It is hard for them to accept the weakness of the adults against earthquake and their failure to prevent it. Therefore they may turn in on themselves, they may be crossed and exhibit different behavioral problems (cf. Yalın 2002; Ayaş, İskender 2003, 286)

8.3 Definitions of Terms in Risk Reduction

After many natural disasters like earthquake, significant tangible and intangible losses were incurred by the society and these losses caused great psychological changes. It is possible to tell that these psychological changes occurred are connected to the severity of the disasters and the experience of the individual (cf. Karancı 2003, 54). In this chapter, the ways to mitigate the damages that occur and the psychological terms show up in risk situations are studied.

As well as resilience and antifragility terms, the mitigation subject mentioned in "8.1.3 Disaster Management" chapter has also been studied more detailed under risk reduction terms title.

8.3.1 Mitigation

Disasters are the incidents which occur in unexpected moments and which unfavorably affect the socio-economic life of the society. Therefore, mitigation and preparedness before the disaster are very important to overcome the disasters with minimum problem (cf. Karancı 2008, 52).

Mitigation process begins at disaster response period and continues until the next disaster. Mitigation precautions and plans target to eliminate the damage and loss, which may occur after the disaster. For this reason, all social measures and activities towards preventing the disaster risk or avoiding substantial damages should be fulfilled during mitigation process (cf. Kadıoğlu 2008, 11-14).

Minimizing the negative effects of earthquakes on the society and making lasting preparations against earthquake, mitigation should be considered important. The four steps emphasized by FEMA on mitigation may be addressed as follows:

- Organizing the sources
- Evaluating the risks
- Creating a mitigation plan
- Implementation of the plan and monitoring its progress (cf. FEMA).

Besides, if plans are made to develop and improve the existing settlement in urban settlings and if mitigation studies are conducted, most of the problems occur after earthquake may be eliminated. So, it is necessary to mention that the physical planning is very important to mitigate the damages from disasters, particularly from earthquake. The benefits of this planning may be listed as follows;

- Minimizing the potential risk
- Mitigating the results of the disasters
- Preventing the secondary risks
- Limiting the impacts of the disasters
- Facilitating response
- Facilitating the normalization at recovery stage (cf. Kadıoğlu 2008, 14).

Based on these information, it is possible to tell that the measures that should be taken before the disaster are the precautions that need to be taken basically to minimize the disaster risk and to respond in a rapid and conscious manner in case of a disaster. Thus, the damage mitigation process may proceed properly and rapidly (cf. Kadığolu 2008, 15).

Sometimes it may be difficult to find solution as the sudden occurrence of the disasters. Therefore, people should be informed about how to act in face of a danger and a risk which they may encounter, what would they need and how would they fulfill these needs. This informing should be done before the problem occurs (cf. Kadıoğlu 2008, 19). Because, with it may not always be possible to stop or prevent the incidents with the precautions taken at mitigation stage, so preparation stage is very important. To be prepared for disasters, the disaster management agencies should work orderly and they should have smooth running plans regarding the situation, which are practiced in advanced. Besides, the importance of sense of obligation in damage mitigation is clear. However, people externalizing their responsibilities about earthquake and landing all the responsibility to the institutions like government or municipalities may cause problems. Therefore, to be prepared for earthquakes, the preparations should first start at individual and family level (cf. Karancı 2011, 54).

For the mitigation and preparedness behaviors to be performed, primarily two cognitive evaluation processes should be overcome. The first one of them is to determine whether the individual is in danger or not by using his/her awareness and danger perception. The second stage is to evaluate how he/she can cope with this danger (cf. Karancı 2008, 52).

Based on this, for the behaviors for taking precautions to show up, it is possible to tell that the individual should have evaluated these stages properly and determined his/her deficiencies.

The simplest rule of mitigation is to take preventive measures against avoidable dangers or protective measures for those unavoidable. Some studies conducted about mitigation are related to the laws and the rules brought by these laws may sometimes not be accurately perceived by the society. For this reason, in disaster mitigation studies, it would be beneficial to produce solutions applicable and understandable by everyone (cf. Güler 2008, 36ff).

As a result of the literature review, it is obvious that it is not possible to mitigate the damages of the disaster effectively without the participation of the local people. Therefore, it is necessary to conduct studies to raise the awareness of the public about mitigating the damages (cf. Karancı, Akşit 2000). One of the topics that should be remembered is that communities consisting of uninformed and uneducated individuals would fail in disaster recovery process (cf. Güler 2008, 41).

8.3.2 Resilience

The resilience concept involves an individual's accord with the change in his/her life during the process occurs as a result of the interaction of the risks and protective factors against the negativities experienced. The risk factors caused by stress and the protective factors that mitigate the negative impacts of risk contribute to resilience concepts which is also identified as a progressive process (cf. Karaırmak 2007, 129).

As a result of the long-lasting researches in the world, it is seen that there are different definitions of resilience concept by different different researchers. This is because resilience is a versatile concept and there are no definitions for which there is a consensus. According to the definitions made, resilience is taken as the adaptation and coping skills of an individual in face of negativities, and for it to show up, there should be risk in the environment. Economical difficulties, war, natural disasters, violence and diseases are considered as risk factors (cf. Karaırmak, Güloğlu 2009, 3).

Resilience concept covers the people in high risk groups obtain good results in incidents expected to be end unfavorable, recover rapidly after traumatic experiences and easily cope with stressful incidents (cf. Masten 1994). Resilience is hidden in the strength to recover and it is ability to return the pattern of behavior already exists in oneself before the traumatic or stressful incident (cf. Karaırmak 2016, 131). Besides, resilience is the factor, which protects the psychological health of the individual facing a great threat like earthquake. Therefore, the resilience oriented studies are important in a country like Turkey where earthquakes are frequent in order to protect the psychological health of the individuals (cf. Karaırmak, Güloğlu 2009, 4).

It is mentioned that the resilience definitions made without real risk or negativity would generally be insufficient. According to Garmezy (1993), two questions should be answered in researches conducted about resilience. These are;

1. What are the risk factors arising from the child, family and environment that unfavorably affect the individuals against their experiences?
2. What are the protective factors that minimize negative impacts on the individual under risky situations? (cf. Garmezy 1993).

The resilience presented by children in face of stress and problems varies depending on the natal and environmental factors (family, school, social environment, etc.). Besides, being exposed to risks during childhood may hinder the development process of the children. The negative experiences which may happen in life may make it difficult for one to lead a psychologically healthy life. This is caused by risk factors. There may be a single risk factor or sometime there may be multiple risk factors. For this reason, recently many researchers started to investigate the interaction of multiple risk factors instead of focusing on a single risk factor, which leads to unfavorable outcomes (cf. Karaırmak 2007, 132).

Besides the risk factors, another mechanism about resilience is the protective factors that make the individual constructive and strong in face of problems encountered. These protective factors are completely opposite to the risk factors and help the individual to increase the resilience ability and to decrease the stress. Self-confidence, intelligence, academic skills, problem solving skills, optimistic perspective, positive mood are listed as the autogenous "inner" protective factors. In addition to these, there are also "extrinsic" protective factors like social support (family and positive close relation other than family). It is possible to say that the unfavorable effects of the incident experiences are minimized and the process to adapt the negativities speed up with the occurrence of these factors in case of risk (cf. Karaırmak 2007, 133).

As a result, when the frequently experienced around the world are considered, the resilience concept gains more importance.

8.3.2 Antifragility

In the book of Taleb (2012) where he addresses the antifragile concept, he takes this concept as providing benefit from the change, disorder and negations. This concept is required for the continuation of the incident and for its sustainability in the long-term rather than the resilience concept explained in the previous topic (cf. Taleb 2012).

While in resilience concept, people know what kind of a stress they need to cope with and it is the adaptation people show in face of these negations experienced, antifragility concept deals with the stress created by the risk situation for targeting strengthening subse-

quently with the experiences gained. Based on this information, it is understood that with antifragility approach, it is possible for people to turn the situation into an advantage by benefiting the existence of stresses instead of estimating the stresses that may occur (cf. Taleb 2012).

According to Taleb (2012), bad experiences and the failures should be considered as the precursors of good things to happen and successes (cf. Taleb 2012). As per this opinion, it is possible to tell that after experiencing disasters like earthquake, people may turn the negations into positiveness by taking the lessons.

Today, many communities know that their lives are in danger due to earthquakes. However, people undervalue the reality risk of the situation when they think of the previous earthquakes they lived through. This may be because the risks exposed in the past during a dangerous incident like earthquake are overcome and the degree of perceiving the possible disaster risks in the future substantially decreased (cf. Taleb 2007, 150). Therefore, in the next earthquake it is likely that there is a large margin of making mistakes and get caught unprepared. Taleb (2007) also mentioned that people are inclined to optimism and this is generally thought to be to the favor of people, and that with this approach they positively support taking risks in general. But Taleb (2007) criticizes the illiterately risk taking which may be caused by this situation (cf. Taleb 2007). Within this context, it is necessary to make correct decisions and take lessons from bad experiences to survive.

Antifragility concept is defending that success may be achieved thanks to the mistakes from such incidents experienced. In other words, antifragility is a concept which tells the the negativities experienced do not demolish a person but make him/her stronger and render him/her creative. Taleb (2012) takes antifragibility concept as an approach which help to reach better rather than resilience concept (cf. Taleb 2012).

Hydra, which has many heads in Greek mythology, is an example to this. When Hydra's head was cut, there emerged two heads for the one cut, and this shows that he becomes stronger rather than dying (cf. Taleb 2012). According to this perception of Taleb, it is understood that once individuals approach the bad incidents with this perspective, it would be easier for them to cope with the problems.

Because the society is living in a oversensitive and fragile world, the individuals may sometimes give up what they can do or what they want to do. But, those who adopted antifragile approach learn what can they do by trying instead of being anxious about the situation, what they should not do next time, when and how to do the correct thing. Besides, with the experiences gained people may create new ideas. However, the exact opposite is also possible and people may lost everything they have. But in the end, for a person who knows what he/she should not do again it is possible to say that he/she is unlikely to encounter such a mistake in the next risk.

8.4 Earthquakes in Turkey

Turkey where earthquakes occur very often is on the Mediterranean Earthquake Belt which is one of the most tectonically active belts. According to the Earthquake Regions Map, 92% of Turkey is within the earthquake regions, 95% of the population lives under the threat of earthquakes and 98% of large industrial zones a 93% of the dams are within the earthquake region (cf. T.C Başbakanlık Afet ve Acil Durum Yönetimi Başkanlığı Deprem Dairesi Başkanlığı 2010, 12). Therefore, Turkey is one of the countries which have the highest earthquake risk and which are affected the most by the damages of the earthquake. When the past earthquakes are analyzed, the magnitude of loss of life and property is seen.

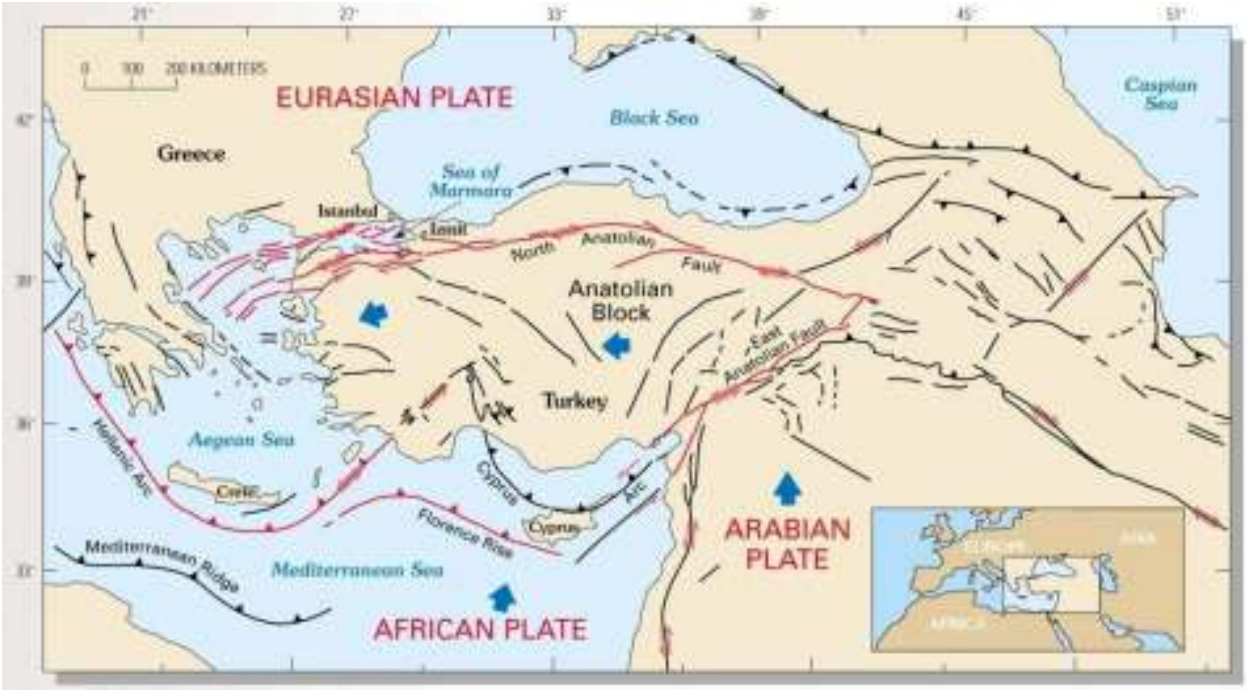

Figure 5: The tectonic map of Turkey includes the Northern Anatolian fault, East Anatolian fault, and Hellenic and Florence trenches (USGS 1999).

8.4.1 Past Earthquakes

Turkey is in the class massive earthquake regions. Therefore, the earthquakes are felt anywhere in Turkey. Small faults are almost everywhere in Anatolia. Larger faults affected the morphology of their location. A part of them is strike slip faults and the other part is horizontal slip faults (cf. Sür 1993, 54).

Turkey, which has high seismicity, experienced many earthquakes in the past and today the effects of these earthquakes are still observed. Most of the earthquakes in Turkey occurred on Northern Anatolia Fault Zone and Eastern Fault Zone. The magnitudes of the earthquakes are higher then 5. Some of these earthquakes are as follows:

1509 Great Istanbul Earthquake

This earthquake, which occurred in September 10, 1509, was recorded as the greatest earthquake of Ottoman era. Due to the magnitude of the earthquake and the resulting damages, this earthquake was named as minor doomsday. In the records it is seen that the earthquake lasted 40 days and people preferred to stay outdoors instead of in-doors.

When the records of that time are reviewed, 130,000 people dies and 1070 houses completely demolished in Istanbul which had a population of 160,000 people and 35,000 residences (cf. Sözcü, online).

May 24, 1719 Earthquake

This earthquake caused great damages in Istanbul and in the vicinity. It was detected that many buildings demolished, the domes of mosques and madrasahs collapsed as a result of 1719 Earthquake. Izmit was one of the cities affected the most from this e-arthquake (cf. Sözcü, online).

May 22, 1766 Earthquake

1766 Earthquake was another earthquake with severe damages in the Ottoman history. In this earthquake which lasted 2 minutes many buildings demolished and many people lost their lives. The aftershocks following the earthquake continued for 3 months. This earthquake was recorded as one of the most severe earthquakes occurred in Istanbul (cf. Sözcü, online).

July 10, 1894 Earthquake

The last great earthquake in Ottoman era was 1894 Earthquake. This earthquake with heavy damages felt in a large area. While severe damages occurred in Eminönü and Fatih regions, many mosques demolished. The Old Bazaar was the most damaged building during this earthquake. The locations affected the most from this earthquake were recor-ded as Yalova and Adapazarı (cf. Sözcü, online).

December 27, 1939 Great Erzincan Earthquake

In Erzincan Earthquake, which is one of the most devastating earthquakes in Turkey's history, 33,000 people lost their lives and 100,000 people got injured. This earthquake in which around 116,000 buildings demolished is considered as one of the greatest e-arthquakes in the world (cf. Sözcü, online).

November 26, 1943, Ladik Earthquake

This earthquake which occurred in Ladik district of Samsun was of 7.6 magnitude. Approximately 2300 people lost their lives, 5,000 people got injured and 75 percent of the buildings demolished in this earthquake which caused great losses (cf. Sözcü, online).

August 19, 1966 Varto Earthquake

This earthquake which occurred in Varto district of Muş is one of the earthquakes with heavy damages in Turkish history. First earthquake occurred on 7th of March and caused death of 14 people and injury of 75 people. The second earthquake occurred in 19th of August and it was recorded as the primary earthquake which was devastating. It is known that there were approximately 2400 deaths and around 1500 injuries after the earthquake (cf. Sözcü, online).

November 24, 1976 Muradiye Earthquake

This earthquake occurred in Muradiye district of Van. It is known that there were people froze to death at temperatures decreased up to -17 degrees as well as people dies under the wreckage. The aid efforts were not effective due to bad weather conditions. Muradiye Earthquake is known as the most devastating earthquake in the region after 1938 Erzincan earthquake. After the earthquake it was detected that approximately 4000 people died, around 500 people injured and nearly 10,000 buildings were damaged (cf. Sözcü, online).

August 17, 1999 Gölcük Earthquake

The center of this earthquake which occurred on August 17, 1999 at 03.02 am and which lasted for 45 seconds was Kocaeli/Gölcük. The magnitude of this earthquake with severe damages was 7.4 and it was felt in Marmara Region and a large area from Ankara to Izmir. Besides, the 3 meters high tsunami occurred as a result of the earthquake damages the city as well. This earthquake which is also called as Marmara Earthquake is one of the greatest earthquakes of the last century due to its magnitude and the damage it caused. According to the official records, there are 18,000 death and 25,000 injured people but according to unofficial information the number of deaths was 50,000 and the number of injured was around 100,000 people (cf. Sözcü, online).

October 23, 2011 Van Earthquake

The earthquake, which first occurred in Tabanlı district of Van, occurred in Erdemit district of Van twp weeks later with the same magnitude. The earthquake was felt in the districts of Van and approximately 700 people lost their lives and 2000 people injured in the earthquake. Many people got into panic due to the earthquake left the city at the time. Two months later it was observed that the life returned to normal (cf. Sözcü, online).

Turkey is under constant risk of earthquake due to the earthquake belt it is located on. It is not possible to prevent these earthquakes. When the past earthquakes are considered, the significance of the issue and the urgency of the precautions to be taken come to the fore.

8.4.2 1999 Marmara/Gölcük Earthquake

Being the epicenter of August 17, 1999 Marmara Earthquake, Gölcük district incurred the damage. In this earthquake, where the most severe devastation was experienced in Turkish history, many lives were lost. This earthquake caused great devastation in Kocaeli, Sakarya, Yalova and Istanbul, and it was felt from Ankara to Izmir.

Figure 6: Focus point – Map of Turkey (Südaş 2004, 83).

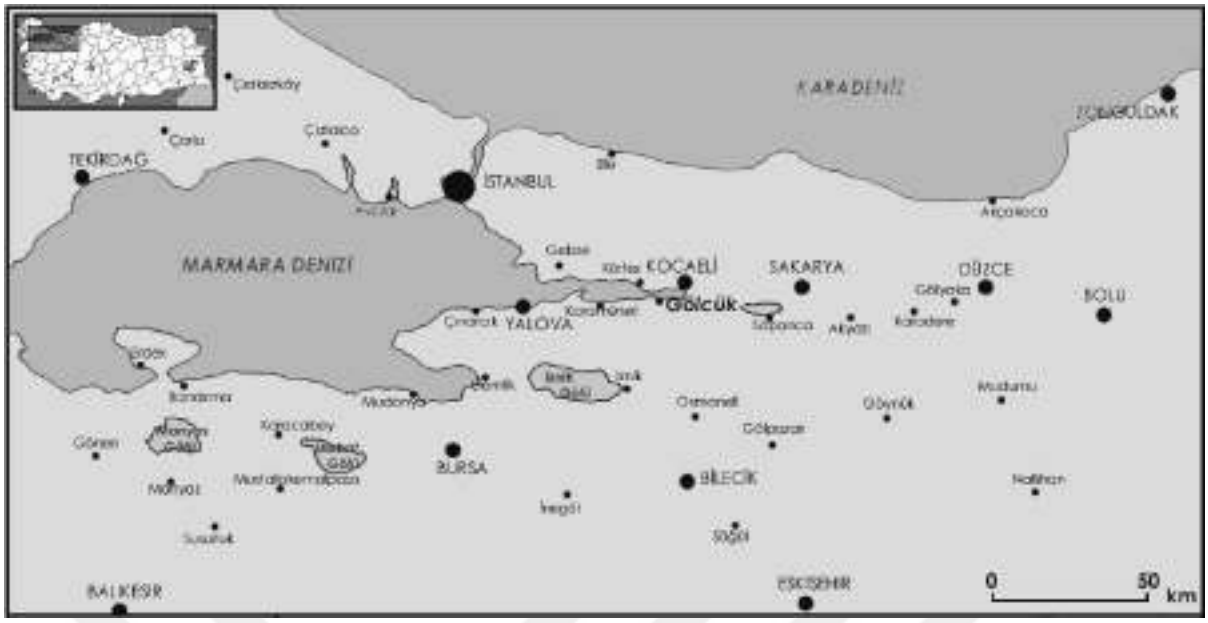

Figure 7: Location map of Gölcuk (Südaş 2004, 83).

Gölcük is located opposite the heavy industry zone to the south of Izmir Gulf and it is remembered with the Gölcük Dock established during the first years of the Republic. There is a rapid urbanization in Gölcük since 1980s and it allows immigrants from all regions of the country. However, due to the improper planning this led to irregular urbanization in Gölcük. Before the 17th August Earthquake, Gölcük was known as a dynamic city with high education level despite the irregular urbanization. But Gölcük which was almost destroyed after the earthquake incurred great losses. 33% i.e. one third of the deaths caused by the earthquake occurred in Gölcük (cf. Şensu 2000, 26).

In Marmara Earthquake which lasted for 45 seconds settlements were changed due to the great damages on the buildings in Gölcük. Accordingly, there were out migrations and there was a decrease in the population. The number of families living in the city before earthquake was 18,000 and today this number is recorded as 6,540. Earthquakes damage the residential units in urban areas more than those in rural areas. This is known to be because of higher population and more artifact structures in urban areas. In Gölcük, the city center was affected the most from the earthquake (cf. Südaş 2004, 76).

Thousands of residences became wreckages after the earthquake, highways cracked, bridges collapsed and there were local fires. This earthquake of 7.4 magnitude caused the death and injury of tens of thousands people. While thousands of buildings in Gölcük city center turned into wreckage, many buildings on Kavaklı and Değirmendere coasts submerged due to the tsunami caused by the earthquake. The waves occurred due to tsunami advanced approximately 100 meters into the coast and it was proved through the algea spread to the balconies of the residences that these waves were around 2 meters (cf. Şensu 2000, 9f).

When the common properties of the residential areas incurred great damage in Gölcük are analyzed, we see that the structures were built on the fault line or on instable grounds. It was detected that many public buildings, particularly education and health buildings, were destroyed because of this.

After Marmara Earthquake followed by 300 aftershocks Istanbul-Adapazarı TEM highway and Istanbul-Ankara railway became unusable. Besides, electricity interruptions and damages on telephone lines due to the earthquake blacked the city out and made the communication difficult. The TÜPRAŞ fire and the toxic substance leakage in AKSA facilities increased the damage in the region and caused the panic and fear spread all around (cf. Şensu 2000, 9f).

People who lived in the region and survived the earthquake faced a lot of problems afterwards. The earthquake victims struggled with sheltering, aliment, health and economic issues as well as the impact of the trauma they experiences, and many of them had mental disorders. Based on this, it is seen that Marmara Earthquake did not only damaged the society physically but also led to deep psychological problems (cf. Ceyhan, Ceyhan 2006, 198).

After the earthquake, temporary settlements consisted of tents for earthquake victims and called "Çadır Kent" (tent City) were built mostly on rural areas. The purpose was to provide shelter for earthquake victims without having more difficulties (cf. Südaş 2004, 79).

While the impact of Marmara Earthquake continued, the second great earthquake of 7.2 magnitude and named November 12, 1999 Düzce Earthquake occurred. The reason for less deaths in Düzce earthquake compared to Marmara earthquake was indicated as the fewer people left in the region due to the deaths in the previous earthquake. Besides, it was possible to overcome this earthquake with less damage due to the time of the earthquake which was 6:58 pm. The reason of this was Marmara Earthquake occurred at night and the people were caught unprepared while they were sleeping (cf. Şahin, Tari 2000, 756f).

8.4.3 Disaster Management in Turkey

Studies, which were prepared for some earthquakes occurred before 1999 Marmara earthquake, were made to raise awareness and to increase the social awareness level about the earthquakes. For this purpose, studies to educate the society about what to do before, during and after the earthquake are being conducted. The program which progressed slowly before 1999 Marmara earthquake gained importance after the earthquake but the studies didn't have fully effective results. Besides, as a result of Marmara e-

arthquake, an earthquake regulation was made to be valid in entire Turkey. Thus, more careful studies were initiated over disaster management (cf. AFAD 2018).

But today when the disaster management studies conducted in Turkish history were reviewed, it was revealed that the studies for the prevention of disaster damages before the disaster occurs were not accurately conducted and that there was generally a delay on this matter. In studies regarding disaster management, "wound bandaging" policies like compensation of the victim's damages by the government or forgiving the debts were generated instead of preventing the disasters or mitigating the existing damages (cf. Özkan, 2003). This does either constitute a final solution for possible future disasters or it was sufficient to eliminate the existing problems.

8.4.3 Earthquake Releated Problems in Turkey

Due to its geological location Turkey is under constant risk of earthquake and it is a country which should always be prepared for earthquakes. As a result of the earthquakes occurred during last 58 years, 58,202 people lost their lives and 122,096 people got injured. Approximately 411,465 buildings collapsed or damaged due to the devastating effect of the earthquake. When the losses incurred in earthquakes in Turkey are analyzed, it is seen that on average 1,003 people lost their lives 7,094 buildings collapsed annually (cf. T.C Başbakanlık Afet ve Acil Durum Yönetimi Başkanlığı Deprem Dairesi Başkanlığı 2010, 12).

Many problems occurred in crisis management practices implemented during disasters in Turkey. The problems in crisis management were detected to be at crisis management centers, in rescue and evacuation operations, transportation services, safety and security operation, in establishing a logistics system for the acceptance, registry, storage and distribution of humanitarian aid materials, arrangement of temporary shelters, infrastructure of the city and in the engineering operations (cf. Yılmaz 2012, 63).

General Problems Encountered at Crisis Management Centers:

When these problems are analyzed, it is necessary to eliminate the post-disaster "panic" feeling to successfully finalize crisis management. If this is not regarded or attempted to eliminate, many problems may occur due to panic environment. Victims of disasters may exhibit uncontrolled behaviors and make uncontrolled decisions with fear and panic. For example, after 1999 Marmara earthquake it was seen that people asked for help from the crisis management with panic but failure to fulfill everyone's request on time caused brutal responses (cf. Esen 2000, 32).

Unexperienced temporary personnel assigned to the earthquake region to help crisis management operations after the earthquake and the tools, food and clothing provided to these personnel which were insufficient to fulfill needs for at least one week brought gre-

at problems along. Once these personnel assigned to provide solution started to become the problem itself, this affected the crisis management unfavorably (cf. Şenyurt 1993, 12; Yılmaz 2012, 64).

According to the researches conducted, the crisis management operations focused on city centers and rural areas were ignored; therefore victims in rural areas could not benefit the aid materials. Besides, not giving sufficient importance to damage assessment operations made it hard to make a sound assessment in the reports after the earthquake (cf. Yılmaz 2012, 64f).

Problems Encountered in Rescue and First Aid Operations:

As a result of the basic opinions on rescue and first aid operations, it was revealed that coordination was poor, the attendants running the operations were victims themselves or they were unexperienced in terms of disaster management. Assigning prepared and experienced personnel at rescue and first aid phase prevents having problems in disaster management country-wide and creating a disaster network (cf. Yılmaz 2012, 65).

When the basic logic of current response and emergency aid plans in Turkey are reviewed, it is seen that the first intervention is made by the attendants assigned in that region. However, these attendants who are expected to get organized and start rescue operations immediately after the disaster fail in face of disaster as the tools and equipment damages during the earthquake (cf. Canpolat 1996, 63).

Due to the indifferent attitude of the public towards disasters in Turkey, there are few aid teams which will participate voluntarily in rescue and first aid operations. As the existing teams are not properly coordinated by the crisis center, they may not provide the expected service. Besides, the foreign aid teams do not sufficiently know the region they will operate and they do not have anyone who knows the language, so that caused difficulties in transportation, communication and aid (cf. Yılmaz 2012, 66).

Problems Encountered in Transportation:

Many people want to reach the disaster area to help their relatives and friends leads to traffic jam, renders some roads unusable due to intensity and prevents aid materials sent from other cities and centers to reach the disaster region (cf. Yalçın 1999, 17).

The damages which occurred on highways, ports and airports due to earthquake and which are not corrected within a short-time created a chaos environment and the post-disaster crisis management operations were not run properly. Besides, the coordination problems also occur in transportation like in every stage of the crisis management and the aids from abroad causes a great confusion due to unability to finalize customs clearance operations rapidly (cf. Yılmaz 2012, 68).

Problems Encountered in Security and Safety Operations:

Although it is known that providing security is the priority after disasters, after the earthquakes with a large scale a confusion and chaos environment occurs. This does not allow smoothly solve the security problem. One of the security and safety issues encountered is the failure to take measures against those who want to benefit from the aids distributed by disguising like an earthquake victim although they are not. Unavailability of updated records of the population living the region in crisis centers makes it impossible to detect these ill-minded people. Besides, it is detected that aid sent to the region does not reach those really in need due to theft and rapine after disaster (cf. Yılmaz 2012, 68f).

It was observed that the darkness after the earthquake demoralizes the public and deteriorates their mood, and thus rescue operations may not be executed properly. Thus, first of all lighting problems should be solved. The Red Crescent or Civil Defense Organization should have mobile generators available in disaster regions. In addition to this, the police, gendarmerie and the troops providing security in th region should be planned from a single center and they should control the entire disaster region (Yılmaz 2012, 69-70).

Problems Encountered in Humanitarian Aid Services:

Distributing the aids for earthquake victims is not the first item in the to do list in earthquake region. However, there is a misunderstanding about this matter in public and in crisis managements. Therefore, focusing on aid distribution instead of the problems that should be solved primarily and guiding the public accordingly does not help resolving the issues in the earthquake region. Hurry of the parties sending and receiving the aid in the humanitarian aid services which should be addressed as a restricted process causes being unorganized, uncoordinated and chaotic situation in the region (cf. Yılmaz 2012, 70).

It was observed that there were used, useless materials and expired medical materials and foods in the aid boxes sent to the earthquake region. However, contributors should not send things they would not use or consume to earthquake victims. Besides, many goods may turn into waste because of unconscious execution of aid campaigns after disasters. To eliminate this, humanitarians may be asked to send durable, long lasting food and cleaning materials through consciously executed aid campaigns. The official and unofficial institutions organizing an aid campaign should always be in contact with local managers; this may help them to find out which materials are needed the most by the victims in the earthquake area and to determine the campaigns according to these needs (cf. Yılmaz 2012, 70).

Temporary Sheltering Problems:

One of the most urgent requests after an earthquake is to fulfill the sheltering needs of the victims. Despite this, following the earthquakes occurred it was understood that the tent inventory in the country was insufficient. The existing tents should resist the climate conditions. But it was determined that the tents distributed by Red Crescent to victims are insufficient and indurable (cf. Yılmaz 2012, 71).

Irregular tent communities occur as a result of the tents erected next to the wreckages by the public arriving the region to search for their relatives under the wreckages. This causes problems in aid distribution after the earthquake due to disorder. In regions with earthquake risk, the temporary settlement areas should be determined in advance. However, the lack of a directive in crisis management centers prepared before the disasters leads to chaos after disasters (cf. Yılmaz 2012, 71f).

Infrastructure Problems:

After great earthquakes, the infrastructure of the earthquake region is severely damaged. For example, the damaged PTT headquarter building, transformers and water wells after Erzincan earthquake, the city could not be provided with electricity and water. The damage on highways and railways hindered the transportation for some time. A similar situation was experienced after Marmara earthquake; the natural gas, fresh water and waste water mains, and transformer stations were damaged. Collapsed communication system created a great chaos (cf. Tekel, Atımtay 1996, 374).

Problems Encountered In Terms of Engineering:

With the pressure of changing socio-economic life, generally a rapid and an unplanned structuring at metropolitan centers is observed. For example in Turkey, many unplanned structures are build in the city center because the legal regulations are not updated; the suitability of the current situation is not audited; there are not enough technical personnel for auditing; and the society tries to get compromises regarding town planning from the administers they elected (cf. Yılmaz 2012, 73).

When the main causes of structural damages occur in earthquakes are analyzed, it is seen that there are mistakes in location selections, mistakes in design, mistakes in construction and lack of audit. For example, the common characteristics of the settlements incurred great damages during Marmara earthquake was being positioned on unsuitable ground (cf. Topal, Okutucu 1998, 7).

As the earthquake is the primary disaster which may not be predicted and prevented, accepting it as a part of daily life may help eliminating some problems. The society should learn to live with earthquake and it is necessary to focus on earthquake trainings to learn what to do at the moment of a possible earthquake. It should be remembered

every individual in the society is involved in effective fight against earthquakes. Actions to raise awareness that it is not only the individual who will be affected by the earthquake but the whole society should be taken (cf. Yılmaz 2012, 78).

9 Conclusion of Theory

Earthquake is one of the most frightening and devastating incidents. Therefore, severe losses of life and property occur after an earthquake. Turkey is among the primary countries with highest earthquake risk, which are affected from the damages of the earthquake the most due to its geographical location, but today it is possible to mitigate the damages caused by earthquakes through conscious and effective methods.

The main reason of the problems that occur in Turkey after an earthquake may be indicated as the poor organization of disaster management units and their failure in recovery operations after the earthquake. This is because the society and the organizations lay weight on operations performed after an earthquake although they mostly need to focus on operation that should be performed before an earthquake.For mitigating the results of the earthquakes that will occur, preventing the occurrence of secondary dangers and limiting the effects of earthquakes, it is necessary to make a good disaster management plan, and the perspective of both the society and the agencies about disaster management should change and awareness should be increased.

1999 Marmara Earthquake should be considered as milestone in Turkey about earthquake. Because, none of the earthquakes until that day had been so much devastating. It is possible to associate the unpreparedness and desperation of the society and the disaster management units in face of this earthquake with the lack of importance given to earthquake issue and the mitigation activities. Although the operations gained importance after Marmara Earthquake, it is seen that the issue has lost its significance after years. Therefore, how much Turkey is prepared for the next earthquake is a question of debate. To avoid experiencing the bad incidents at that date again, it would be beneficial fo the disaster management units to give importance to pre-earthquake preparedness operations and to inform the society accordingly.

In the research conducted, it was determined that the psychological impacts are as deep as the physical effects of the earthquake. Due to the occurrence of the earthquake at an unexpected moment, it is seen that it may lead to permanent psychological problems in people. Some people have high coping skills in cases of risk while some other may develop PTSD after earthquake. For this reason, earthquakes are considered as a vexed and terrifying issue. Within this context, the most significant psychological responses occur in the society after earthquakes are fear and anxiety. This is associated with the lack of information of the people in the society about earthquake and being caught by the earthquake unprepared. So, in the damage mitigation activities, which should be perfor-

med before earthquakes, the psychological problems which may occur in the society should be addressed and psychology oriented activities should be performed to minimize these problems.

Facing their vulnerability causes people who experience traumatic incidents to hardly overcome the period after earthquake. It is particularly seen that the parents whose safety perception is damaged reflect this to their children and thus the children are more affected by the disasters than the adults. The children who are aware of their weakness have difficulty in understanding that earthquake is an incident that happens beyond their control. In this context, it is important that parents and especially the children are informed about earthquake concept. By this way it may be possible to increase awareness and prevent the problems, which may occur.

After 1999 Marmara Earthquake, the first aid operations after the earthquake were insufficient and ineffective due to the insensitivity of the public towards the disasters and the failure of the disaster management agencies to organize. Therefore, while making a crisis management plan, by giving proper importance to creating experienced and knowledgeable teams and emphasizing the first aid in the public, it might be easier to reach those who need help after the earthquake. For this, of course, not every one in the earthquake region should be considered as an earthquake victim. Besides, great problems that occur after earthquakes like security, infrastructure, transportation and sheltering may be fulfilled through crisis management.

While getting prepared for an earthquake, there are three stages that should be regarded by the society and the organizations. These are before, during and after the earthquake. Measures to be taken against an earthquake, increases the survival chance of a person in a possible earthquake and ensures getting over an earthquake with minimum damage. Therefore, the awareness on earthquake should increase and things to do before, during and after an earthquake with a good plan should be learned. This education is important to be prepared for a possible earthquake on social scale. As mentioned by Güler (2008), the societies consisting of individuals uninformed and uneducated would fail in the fight against disasters (cf. Güler 2008, 41).

III Empiricism

10 Focus Group Interview with Earthquake Survivors: Gölcük Area

10.1 Aim of the Research

The purpose of the researcher is to determine the problems that should be solved in the future by analyzing the experiences of the people who lived the 1999 Earthquake at the main center, the imperfections and the problems occurred at that time.

Another purpose of this study is to determine how much the evaluations in this chapter coincide with the existing literature about 1999 Earthquake given in the early chapters of this thesis.

10.2 Research Method

In this chapter of the research, it was decided to make a qualitative analysis to determine the problems occurred by investigating the experiences of the people who lived the 1999 Earthquake at the center at the time of and afterwards the earthquake. It was intended to determine the approach of the participants towards earthquake concept and their complaints after the earthquake. Besides, the data revealed as a result of the research and its outcomes plays an important role in determining the problems occurred in 1999 Earthquake and the possible solution recommendations. This study involves an inductive process as it is seen the following figure. In this path to be followed throughout the research, the researcher is intended to make concepts, hypothesis and theories out of details.

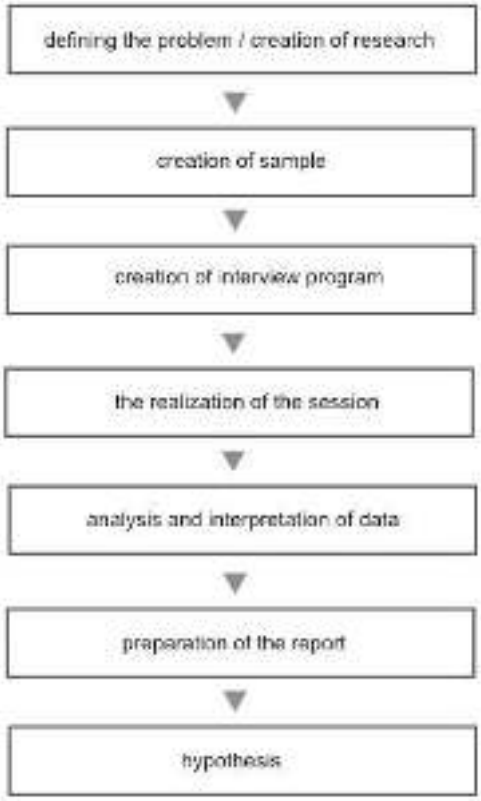

Table 3: Inductive Process of the focus group interview (own graphic)

In line with the purposes of this research, it was decided to apply the most common interview method in qualitative researches to achieve detailed information about the subject matter. This is because interview is a quite successful method to reveal the perspectives, experiences, complaints, feelings and perceptions of the people (cf. Şahin 2009, 11). Therefore, semi-structured interview method is used in the dissertation study. The interviewer remained loyal to the previously prepared subject and questions, and used some additional questions during the interview to obtain more detailed information on some matters. Besides, thanks to the interview form the scope of all questions related to the research problem were assured. The questions prepared are preferred to be open ended questions to enable a better investigation of the matter.

The purposes targeted with the interview are as follows:

- How the earthquake victims affected from 1999 Earthquake
- How did the pre-earthquake preparation process progressed
- Dangers occurred at the time of earthquake and how they got through them
- How did the post-earthquake period progressed
- Determining the problems occurred after the earthquake
- Learning the thoughts about a possible earthquake

At the interview stage, the focus group method, which is a qualitative data collection method, was preferred. The reason for preferring focus group interviews with the earthqua-

ke victims is the wish to obtain multidimensional qualitative information from the participants about earthquake as a result of the in-group interaction. Participants help to create a flow of various information by triggering the thoughts and feelings of each other Bu this way, it may be easier to talk about the problems experienced by getting to the bottom of the information at the surface (cf. Şahin 2009, 28).

The researcher became a natural part of the research through the observations during the interviews, proximity to data sources, and the command of the subject matter. She observed the participants during the interviews to understand how they acted in the environment they were in, how they reacted to the behaviors of other participants and their reasons. Then, the observer made an analysis about the thoughts, feelings and actions of the participants based on these observations by using empathy map method. The purpose in applying the method is that the way the participants tell something is as important as what they tell during focus group interviews.

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Descriptive data obtained from these interviews constitutes the basis of the analysis.

10.3 Setting of the Interview

TOPIC	▸	1999 Marmara/Gölcük Earthquake
GROUP SIZE	▸	5 person
SELECTION OF INTERVIEW PARTNERS	▸	All of them have experienced 1999 Earthquake in Gölcük
LOCATION	▸	Izmit Ramada Hotel
TIMING	▸	2 hours
RECORDING	▸	Voice record
OBSERVATION	▸	Interviewer observation: communication ability, feelings, behaviours

Table 4: Setting informations of the interview (own graphic)

The participants selected for focus group interviews in this study were chosen among the people with information and experience about 1999 earthquake. For the detailed and in-depth analysis of the data gathered in qualitative researches, it is hard to include many individuals in the scope of research (cf. Şahin 2009, 15). Therefore, the focus group in

the research consists of 5 people experienced 1999 earthquake. The amount and the detail of the data obtained in such manner would be a quite lot.

To make the interviews with a homogeneous participant group, all the participants lived in Gölcük, worked at Sümerbank Factory during the same period, consisted of women in the age group of 57-67 years, and most importantly, all of them experienced the 1999 Earthquake at the center. The contact with the interviewers was established through a retired Sümerbank worker, Seza Kurnaz. The interviewer chose an interview location close to the region where the participants lived. This is to avoid the participants feel alienated about the venue of the interview and to conduct the interview in a comfortable and warm environment. Izmit Ramada Hotel was contacted in advance as the interview venue and the interviewer arranged the interview table in a comfortable and informal manner. This arrangement was made to allow the participants to express themselves more comfortably and to let them answer the questions without feeling any pressure.

The time of interview was determined as 1:00 P.M. and the dining hall of Ramada Hotel was preferred to conduct the interview in a silent environment. The unoccupied restaurant of the hotel at the time chosen plays an important role in terms of calm and smooth progress of the interview. The table at the restaurant was arranged to allow everyone to see each other and by considering the possible needs of the participants.

As the native language of both parties are Turkish and for the in-depth analysis of the matter, Turkish was selected as the interview language and transcribed in Turkish. The researcher translated the parts in the analysis section by adhering to the spoken language of the participants.

The session duration was determined as 2 hours to review the subject matter entirely and to have it discussed by everyone. The interview was also aurally recorded with the permission of the participants to be reviewed later. The researcher personally spent time in the area and completed the study in participant role by directly interviewing the participants.

10.4 Analyses

The participants agreed that the interview conducted would be recorded and that their feelings and thoughts would be used within the scope of this thesis. As mentioned in the research method, the interviewers were labeled as A, B, C, D and E to prevent any confusion in the analysis part. The people interviewed are the earthquake victims named Gülhiz Mercan, Nuran Doğan, Gülsevim Düzgün, Aynur Erdoğan and Necla Dinçer, respectively. The analysis conducted after the interviews which lasted two hours are given in this section.
The participants encouraged each other to talk through group interactions and in general terms, the interview went in a comfortable and fluent manner. Thanks to the trust estab-

lished by the interviewer on the participants, they told the moment of earthquake they experienced in detail without hesitation. The participants answered all the questions asked and completed the interview time with patience to allow the study to progress smoothly. Their support to the purpose of the research and the excitement and honor they felt for having this matter on the agenda again increased the motivation of the interviewer on the research subject.

The interviewer observed the hand gestures, mimics, changes in the voice and mutual communication of the participant group. As a result of these observations conducted, the interviewer created tables which indicate what the participants told individually during the interview, what they might have thought and felt as they talked and how they acted. These tables are addressed as the summary of feelings and thoughts of the participants during interview for the ease of analysis.

Interview A

Gülhiz Mercan, who was born and raised in Izmit, had been the first person to answer the questions in the focus group interview. Her whole school life passed in Izmit; she studied at Kocaeli University. She finalized her professional life at Sümerbank where all other participants also worked and retired from there. She lived the 1999 Earthquake in Gölcük and she remained under the influence of this experience for many years.

When her replies during the interview were analyzed, she remembered the time of earthquake and mentioned how difficult was that moment by saying *"I felt anxiety and despair, I was so afraid. Everything was wiped off within a moment... There was a great chaos outside... It was terrible..."* (Interview A). It is understood from her words that she feels herself lucky for surviving but she is sorry for the injuries, accidents and devastation occurred in the region.

Gülhiz Mercan emphasizes that there were no information and warning regarding a possible disaster before the earthquake by indicating that *"we had never even heard of the probability of earthquake, therefore we were not prepared, we didn't know what to do. We were completely inexperienced and ignorant..." (Interview A).* From the way she spoke these words, it is seen that she understands how important the matter of earthquake is but she could not understand why was that disregarded.

The participant mentioned that the research conducted meant a lot to her and that she had hope for the future. According to the observation analysis of the interviewer, the participant gave clear answers to the questions in a concentrated manner. It is thought that the participant's purpose here is to steer the study correctly with her answers. The participant had a quite nature and treated everyone in the interview politely, and she completed the interview with her brief and clear speech. In Table 5, the findings from the interview are shown with the empathy map prepared based on the feelings and thoughts of the participant.

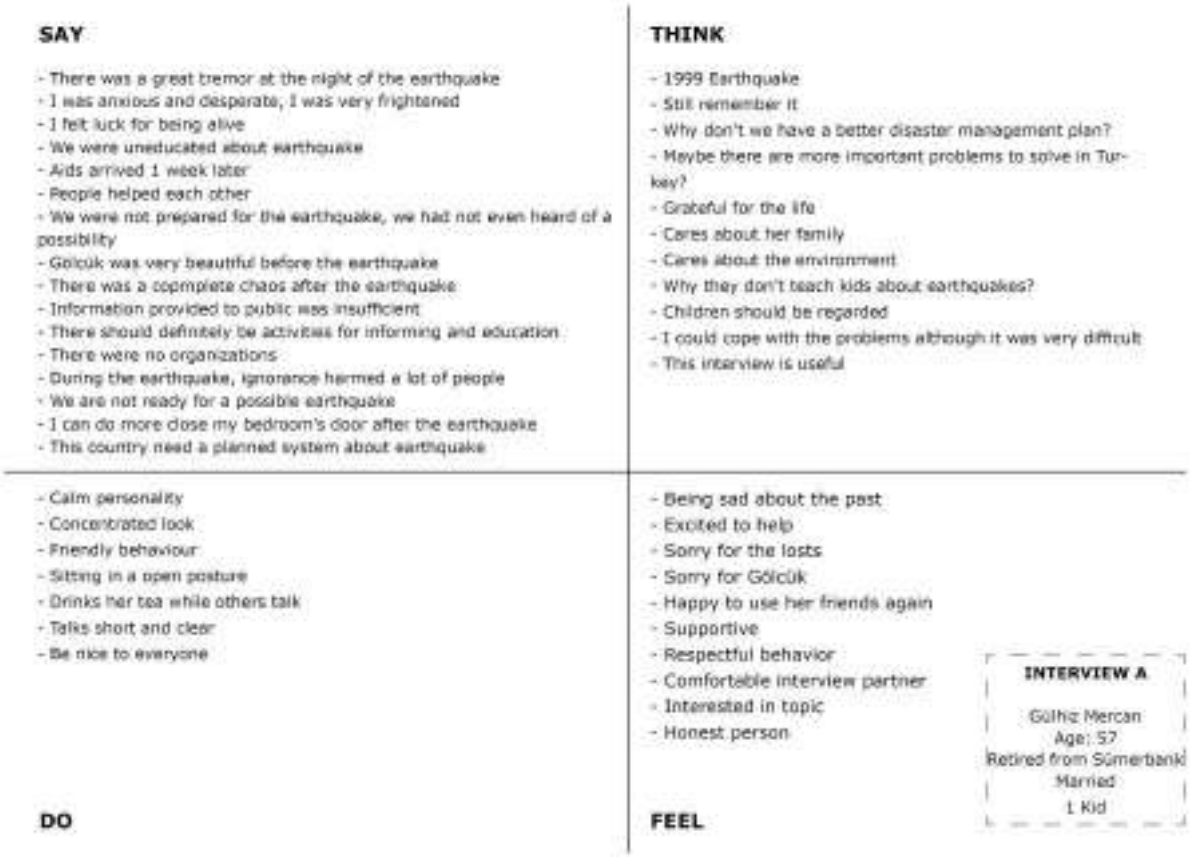

Table 5: Empathy Map, Interview A (own graphic)

Interview B

Nuran Doğan was born in Sivas and has been residing in Izmit since she was three years old. After working at Sümerbank for years, she retired from that company. Today, she is working at women entrepreneurs' council of Chamber of Commerce and Industry. She experienced the 1999 Earthquake in Gölcük in her house with her spouse and two children.

As she had been through a 5-magnitude earthquake in 1995, she qualified herself as experienced while talking about 1999 Earthquake. Nuran Doğan alsı mentioned that feeling she had during 1999 Earthquake was not fear but she was concerned about her children because she was not sure about the durability of the building. To express with her own words:

> *"That day, the apartment block was completely empty, everyone went to a celebration. My only concern was how would I protect my children. We were living at the top floor and I thought how would I climb down the stairs, as the building was very high. I was not sure about the durability of the building and I felt as if I was looking down a cliff when I looked down from the stairs. I was not afraid of the earthquake but the possibility that the building might not be durable" (Interview B).*

Her words, *"after the earthquake the electricity was interrupted, everywhere was dark which made it difficult to move or do something. There were so many deaths because of the buildings collapsed, everywhere smelt death... I live that moment again as I tell. It was terrible…"(Interview B)* revealed that she remembered the moment of earthquake and it is understood from the way she told the incident and her voice that she did not want to live through it again.

The empathy map created based on the data obtained from Nuran Doğan after the interview is shown in Table 6.

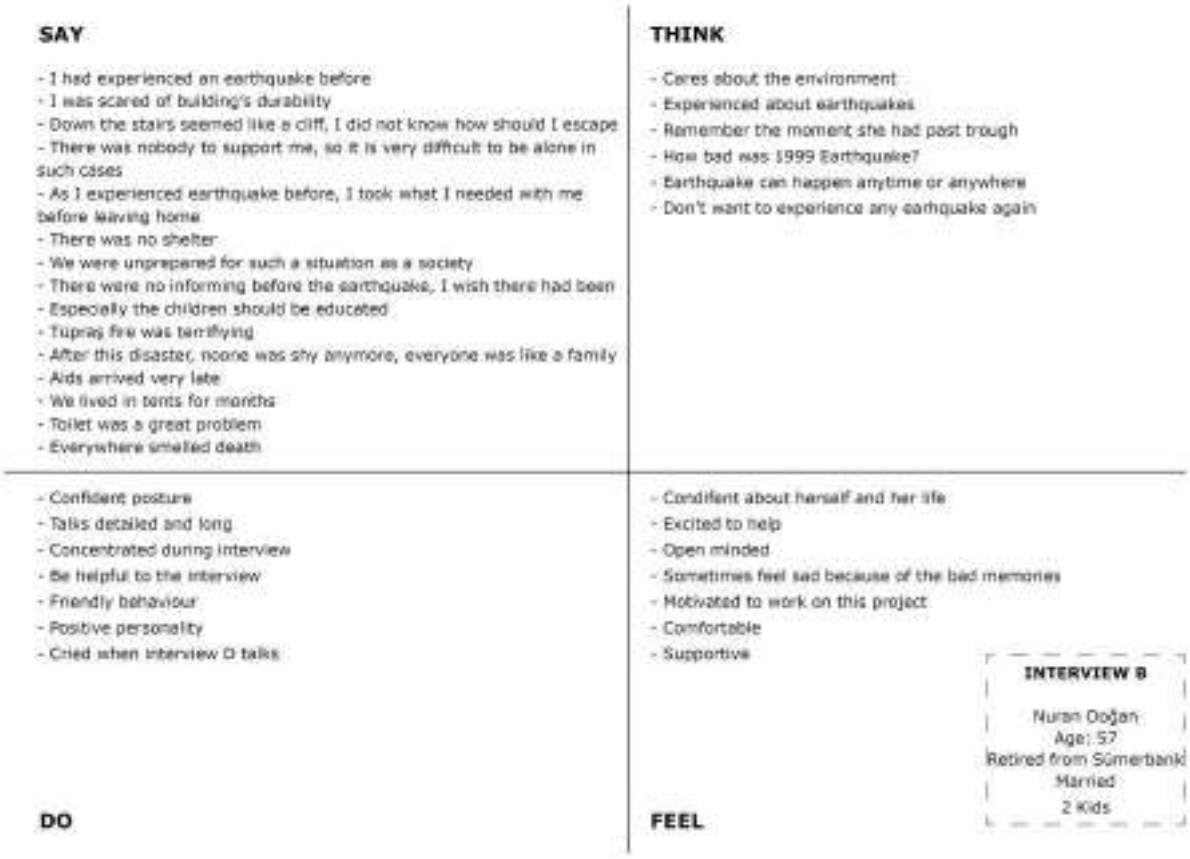

Table 6: Empathy Map, Interview B (own graphic)

The participant replied the questions lengthily and in detail by staying focused throughout the interview, and she made no compromises from her positive personality while telling how sad and devastating were the experiences. She as well thinks her positive personality helped her and her circle to overcome the earthquake.

The participant was interested about the project and her excitement about helping was clear from her behaviors. As she takes office in the women entrepreneurs board of the Chamber of Commerce and Industry, she supported the interviewer about the research she has been working on and mentioned that she might provide any help if she needed.

Interview C

Gülsevin Düzgün, who was born and raised in Izmit, completed her education in Izmit and started working at Sümerbank Factory. Today, the participant is retired and lives in Izmit with her family; she experienced the 1999 Earthquake in Gölcük and her husband could not get over the earthquake for many years.

She defined the moment of earthquake with words like fear, panic and chaos, and mentioned that what had happened reminded of a scene from a thriller movie. The participant expressed 1999 Earthquake was so intense and caused great losses in the society by saying *"as a child I lived through an earthquake but the 1999 Earthquake was unlike anything I experienced before. The moment of the earthquake and the afterwards were really terrible. I didn't know what to do, I think I was that desperate for the first time..." (InterviewC).* Besides, it was understood from the emphasize on the feeling of despair that she did not want to get caught by a similar incident unprepared.

During the interview the participant mentioned the plundering of the aids and the thefts in the region and she thinks that the post-earthquake crisis management should be conducted better. She also emphasized that it is very important to educate the society on the subject matter.

The participant was happy that the earthquake issue was brought to the agenda again and mentioned that she would always support the project by saying *"the earthquake issue is forgotten today. I am very happy that it came up again. I would do anything I can for your project with pleasure. I hope the future generations will be more prepared for earthquake thanks to such projects" (Interview C).*

The participant had emotional moments during the course of the subject matter discussed and she completed the interview by speaking concisely and listening other speakers carefully. In Table 7, the findings from the interview are shown with the empathy map prepared based on the feelings and thoughts of the participant.

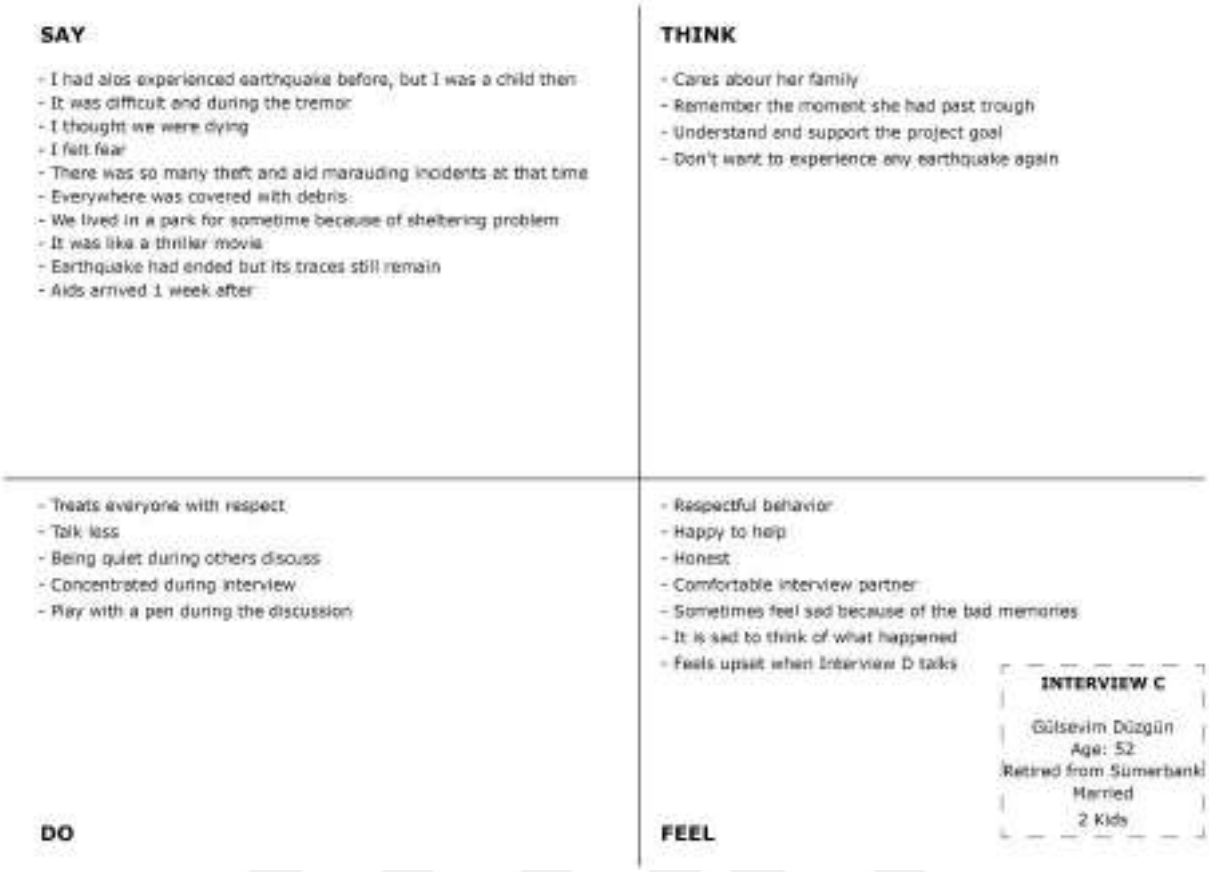

Table 7: Empathy Map, Interview C (own graphic)

Interview D

Aynur Erdoğan is one of those incurred great tangible and intangible losses in the e-arthquake and she was rescued after remaining 24 hours under the debris. She spent her entire life in Izmit and she also retired from Sümerbank like other participants. She lost her husband because the building they lived in collapsed during the earthquake and to-day she lives with her mother in the earthquake residences built for the victims after the earthquake.

> *"The aids were so delayed that the people helped each other. After being rescued I needed clothes and people around shared their belongings with me without hesitation. It was a very special and a very nice feeling…" (Interview D)*

It is possible to associate the smile on her face as she spoke these words with the thought that earthquake did not demolished everything but revealed nice feelings like cooperation.

She influenced the interview group deeply with her words *"I am telling again, that moment was like a scene from a movie. Such a disaster may only be seen in movies. Helicopters were coming to take the injured people. They used the ice rink in the region as morgue. There was*

a real chaos on the roads. People were looking for their families. Everywhere was surrounded with the smell of dead bodies. Ohhh... May God never puts us through such a disaster again..." (Interview D). She told as if she lived that moment again, and it is possible to think that this caused that moment to revive in the minds of those experienced that earthquake. During some statements, the eyes of the participant were filled with tears and she reflected with her mimics that she did not want to live through it again.

According to Nuran Erdoğan, earthquake is one of the most important matters which should be addressed. By showing her experiences as an example, she mentioned that the earthquake issue should not be forgotten and that the society should be educated on the matter. The empathy map created in line with the analysis of the interviewer after the interview are shown in Table 8.

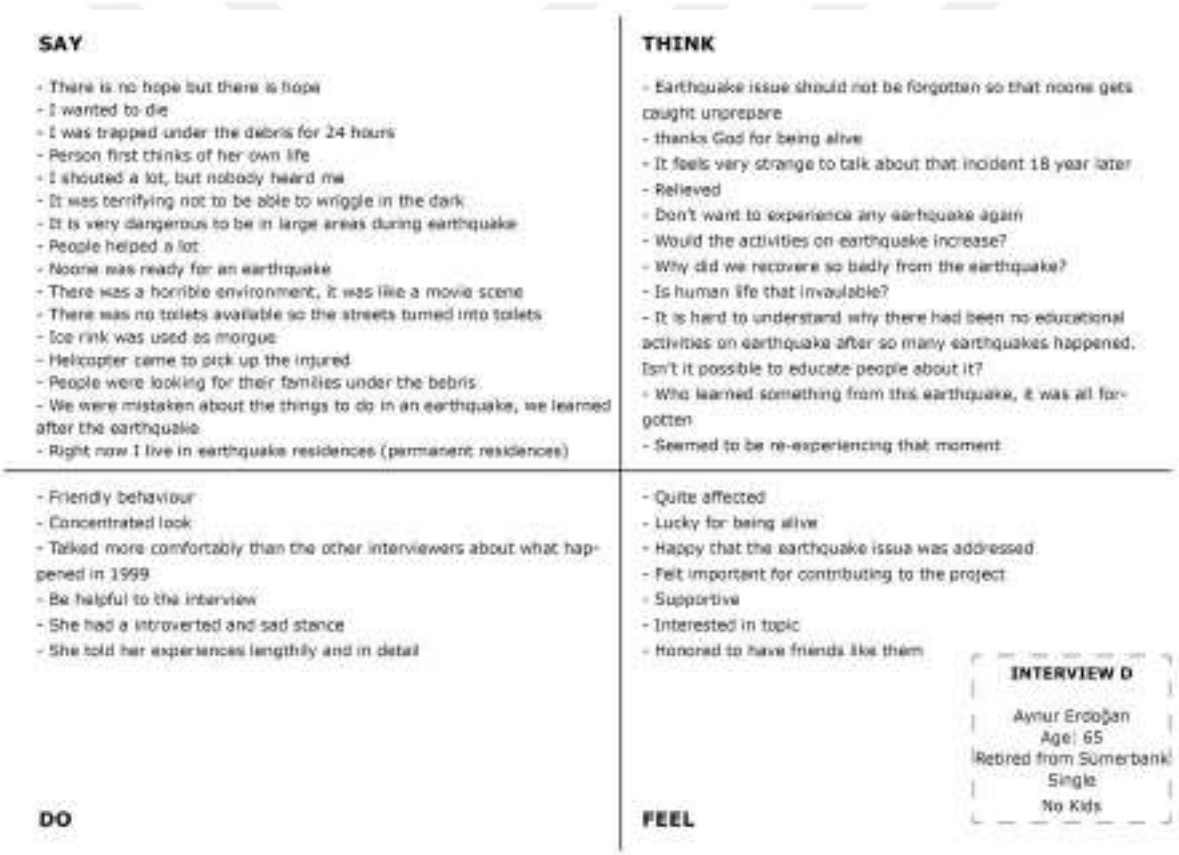

Table 8: Empathy Map, Interview D (own graphic)

At the end of the focus interview conducted, the participant thanked the interviewer for not forgetting the earthquake issue and for trying to do something on the matter, and that this was so valuable for her. The participant, who is ready to provide any help, wanted to show the earthquake residences she mentioned to the interviewer by allocating additional time after the interview. The interviewer left the interview venue with the participant, visited the area and made certain analysis. The examples of the regional residences are given in Figure 8 and 9.

Figure 8: Permanent residences (own figure)

Figure 9: Permanent residences (own figure)

Based on the statements of Aynur Erdoğan these residences named as "Permanent Residences" were built in compliance with the "earthquake law" enacted after 1999 Earthquake. The earthquake victims whose houses were collapsed were domiciled to these residences for a certain fee. While walking around the area, the interviewer noticed that the houses built were not high-rise, the streets were wide and there were plenty of green areas and wide spaces. Based on this, it was understood that some mistakes were discovered and corrected.

Interview F

Necla Dinçer was born in Bayburt and she has been living in Izmit since 1957. The participant completed her education in Izmit and retired from Sümerbank Factory in 1998. Necla Dinçer interpreted the 1999 Earthquake as an calamity and mentioned that feelings of shock, fear, hurry and despair were dominant in the region.

From her answers to the questions, it was observed that she reproached from time to time about the reason why the human life and needs were well down in the list of priorities of the government. The participant also said *"there are many criminals in this earthquake" (Interview F)* and it is possible to assume that she thinks the earthquake issue is not given the due importance within the society and that this caused many accidents and devastation.

The participant emphasized that the buildings were not durable and 90% of Izmit region consisted of marshes, and she stated that the city was not prepared for an earthquake neither physically nor mentally. The interviewer grieved while telling the moment of earthquake which she qualified as calamity and she expressed she was happy that the earthquake issue was brought to the agenda again.

With her words *"We were not prepared for an earthquake. We didn't know what to do. If we had been informed, educated on such a matter in advance, maybe we wouldn't have suffered that much…"(Interview E),* she emphasized the ignorance of the society about earthquake and with a realistic approach, she mentioned that the devastation incurred was not only the impact of the earthquake. The participant had an excited nature and from the turn of phrase, it was understood that she wanted to share everything she knew and remembered with participant. Necla Dinçer, who stated that she was very happy for such a study on the earthquake issue, which was considered to be ignored or forgotten at the present time, said, *"These issues should be regarded, human life is very important. The society should know what to do during an earthquake. On the 17th of August, many people died of ignorance…" (Interview F);* these words indicate that she considers ignorance as one of the reasons of the accidents and deaths occurred after the earthquake and that she supports the studies conducted on the matter.

The empathy map created based on the data obtained from Necla Dinçer after the interview is shown in Table 9.

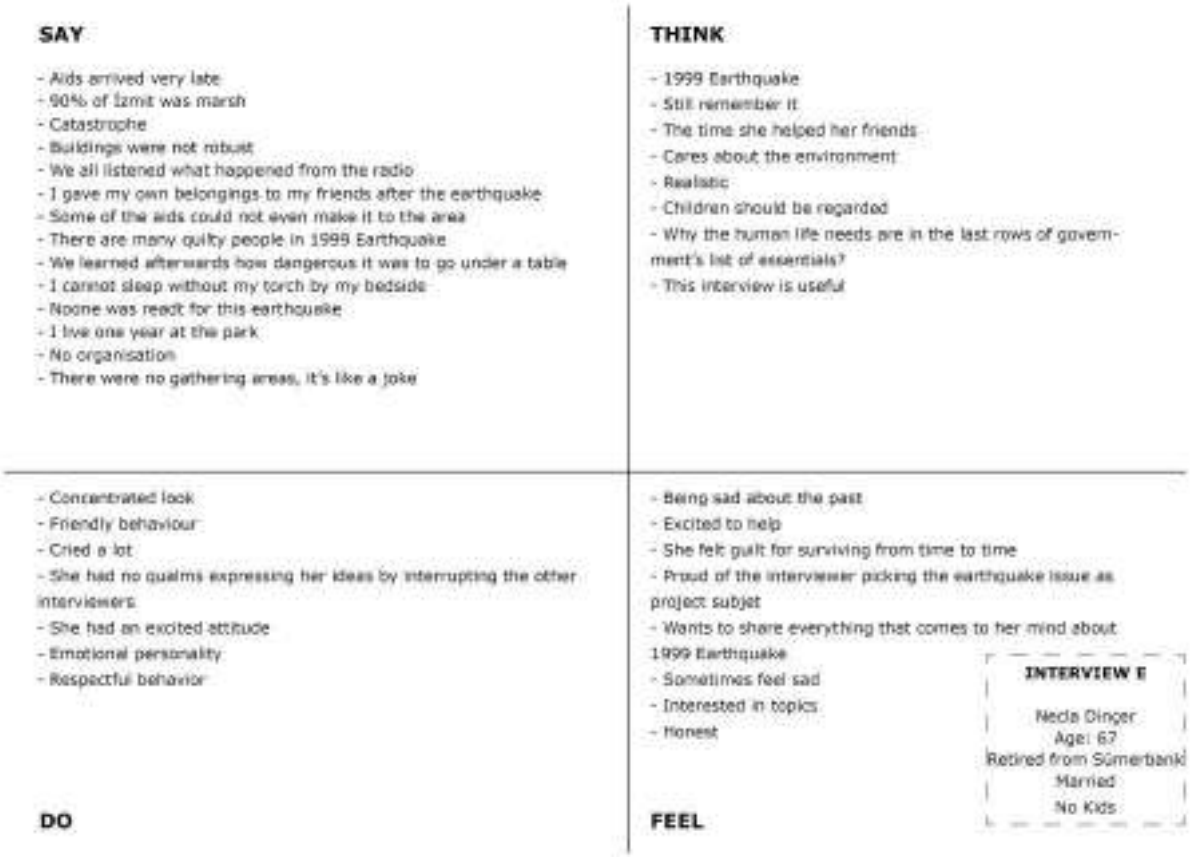

Table 9: Empathy Map, Interview F (own graphic)

In the "Common Review of the Questions" section, there is the in-depth review of the answers of the participants which were given to the questions asked during the interview and analyzed using Empathy Map method.

Common Review of the Questions

In Table 10, 6 topics agreed by color-coding method are given. These 6 topics created are the categorized form of the questions asked during the interviews. In the table, the questions asked during the interview are given in the 2nd column under the title "questions asked" and there are the recommendations of the interviewer in the 3rd, i.e. the last column of the table. In the study, it was intended to summarize the analysis made with this table.

TOPIC	QUESTIONS ASKED	ANALYSES
Experience and Feelings	•Can you please tell us the moment of earthquake? How did you experience 1999 Earthquake? •Can you tell us how you felt at that moment? •How do you think the society get over after the earthquake? •Do you have any habits from that period? If any, can you tell us about them? •How would you define the psychological effects of the earthquake on you? How did these effects influenced your living? •What would you recommend to resolve the problems?	People who lived through the earthquake may be better prepared to the next earthquake through their experiences and their sensitivity to the matter.
Requirements	•What were the needs after the earthquake? •How did you fulfill your needs like food, beverage and water after the earthquake? •How did you eliminate your problems like sheltering and heating?	The authorities should prepare a regular aid-need plan to fulfill the basic needs and eliminate the sheltering problem.
Help and Cooperation	•How were the aids provided? •Can you tell about the disbursement of aids?	In a crisis, cooperation in the public came to the forefront.
Informing and Education	•How were the briefings about a possible earthquake risk before the earthquake? •What did you know about what to do during or after the earthquake before the earthquake occured? •What are the wrongs thing you knew about earthquake? •What do you think about the progress of the earthquake training process today? •What do you think about the earthquake education at schools?	Educating the society, especially the children, about the earthquake and about what to do before, during and after the earthquake would minimize the damages which may occur.
Crisis period	•How do you think this process was managed after the earthquake? •How were your needs fulfilled? •Can you tell about the disbursement of aids? •What can you say about the security in the earthquake area? •What are your comments on the healthcare services? •What are your comments on the psychological services? •What do you think about Search and Rescue operations? •What do you think is the greatest problem after earthquake?	A "Disaster Management Plan" prepared properly and practiced for several times may mitigate the problems which mayoccur in the next earthquake.
Being prepared	•Were you prepared to this earthquake? •What is the condition of your earthquake bag prepared after 1999 earthquake? •What do you think about earthquake drill and preparing you home considering the earthquake? •Are you prepared for a possible earthquake?	The more people are informed on earthquake, the stronger they would be in the face of earthquake; therefore, a person should individually educate him/herself and take precautions against the earthquake may allow him/her to incur minimum damage from the earthquake.

Table 10: Color-coding illustration (own graphic)

Experience and Feelings

In order to conduct an in-depth review of the subject matter and to learn about the experiences of the earthquake victims who lived through the 1999 Earthquake, the participants were asked the moment of the earthquake and how they experienced the earthquake. Some parts compiled from the answers of the participants to this question are as follows:

"It was 03:00 A.M. when the earthquake occurred. It attracted our attention that the weather was very hot before the earthquake, but of course we didn't thought of the possibility of an earthquake. We woke up with a blowout. It was such a strong sound that it raised us from our beds. The trembling at the moment we raised was something we had never experienced so far. It was like you were on a boat in a rough sea and you were shaking. It was more intense than the earthquakes we had experienced until that day. It also lasted very long. We got out with a noisy clamor, thanks God our building was standing but it is very difficult to describe the fear I felt at that moment..." (Interview A)

"After feeling that great trembling, I thought how could we get out. We were in an apartment block of 7 floors and I thought what if the stairs were collapsed. Seeing that the stairs were solid, I took the kids and went out. I didn't know anyone outside, but there was ambient like a nightmare. Collapsed buildings, people crying. It was terrible. We gathered with my neighbors. As there were no meeting place determined for us, we used the playground as the meeting place. Everyone was sharing. In the meantime we heard that a fire started at Tüpraş due to the earthquake. In the news it was said that the fire was very severe and that everyone in the vicinity should move away. All of us got in the cars and started to escape as if a volcano had erupted. People who didn't have a car got into the cars of others. Everyone was trying to run towards the highlands in a convoy. There were no places where we could buy food or beverage. It was a matter of life and death. We spent 4 days in an open forest. It was really hard. We had nothing to get heated. People living in the villages around shared their food with us. We got help which the government failed to provide from people. As we struggled to survive, we learned that the fire was extinguished. We heard that there were no losses but if there had been an explosion the entire Marmara Region would have demolished. Then, our escape would have no meaning. After the news about the extinguishing we returned but we couldn't get into our houses because of fear, so we lived in the living space we established in the park for a long time..." (Interview B)

"I tried to go to the children's room as the quake continued but I couldn't manage to stand, I fell off and went to the children by crawling. Just then the ironing board behind the door fell and blocked the door. I was not able to reach the children because of that. I was so afraid of being unable to rescue them... I got contracted at that moment due to fear and panic, I couldn't do anything. Kids were more reasonable right then and they managed to open the door. Then we went out; everyone was already outside. What we lived in the park were similar to what Nuran (Interview B) has told. This earthquake affected my husband the most. He went to a psychologist after the earthquake and he hardly overcame that trauma. We built a prefabricated house in the park and lived there for a year, my husband on no account stepped in the house..." (Interview C)

When these answers are reviewed, it is understood that the participants individually experienced the earthquake in a different manner, but their feelings, fears and needs were at an equivalent level. Based on the data, it is seen that panicking during earthquake may lead to problems at the moment of making vital decisions. Besides, the participants first thought of their children at the time of earthquake and this may be addressed as an instinctual situation. The participants telling about their earthquake experiences told what they felt at that moment as follows:

> *"I was quite concerned. I was frightened. It was terrible for someone not to know what to do." (Interview A)*

> *"I was concerned rather than frightened because I had experienced an earthquake before and I was more frightened at that time as I didn't have any experiences. This time I first thought of my children. I was concerned about how could I take them out, how could I rescue them." (Interview B)*

> *"I was panicked, I feared of death..." (Interview C)*

> *"The building collapsed over me before I understood what was happening. I thought I was dying. It was like a nightmare, I was very frightened and worried thinking what if I couldn't make it out of that debris..." (Interview D)*

> *"An unexpected calamity had occurred. At that moment all feelings like shock, fear, hurry, despair were altogether. We didn't know what to do." (Interview E)*

Based on these data collected, the participants emphasized that they experienced feelings like fear, anxiety, shock, hurry and despair, and they hardly overcame that period. It was also determined that individuals who experienced earthquake before approach the earthquake with fuss rather than fear and that people who had no information about earthquake tries to cope with the fear of death.

When the feelings like panic, fuss and fear get together, they may cause a chaos in the society. In order to analyze the impacts of these feelings in 1999 Earthquake, the participants were asked how the people overcame the period after the earthquake. According to the data obtained, it is possible to tell that the majority of the society had difficulties in overcoming the earthquake. It was detected that this earthquake addressed as a great disaster caused considerable tangible and intangible losses in the society. The answer of Interview E to this question is as follows:

> *"The earthquake did not only devastated the city but it also wounded the people deeply. When the people learned that they lost their family, they couldn't rejoice their survival. There were injured people, deaths, and collapsed buildings everywhere. They were not easily erased from the memories. This society hardly overcame the impacts of the earthquake. I think we still have fears inside that we could not get over." (Interview E)*

Based on this, the participants were asked whether they had any habits from that period. Some of the answers given are as follows:

> *"Once, seeing the stuff we prepared for earthquake (like torch, whistle) affected us. Now they became a part of our lives. We no more live as if an*

> *earthquake would occur; we say what would we do if it happens. Therefore, seeing those stuff makes me feel safe. We keep them prepared as a precaution. Besides, I had never closed the door of my bedroom ever since that day. As we experienced the earthquake at night, I feel as if it will happen at night again. So I am not closing the doors of the rooms, in fact I check, correct the stoppers we placed in front of them every night just in case." (Interview A)*

> *"We were under the influence of earthquake for many years. We feared thinking what if it happens again. Therefore, I never place anything behind the doors. I learned this after the earthquake. I leave the exits clear. To prevent any obstacles if we need to run. I always put some clothes by the outer door which we can take as we leave. We also keep a torch and a whistler by the bedside." (Interview B)*

> *"As I was rescued under the building, I don't feel well in narrow areas anymore. I always keep a torch and a whistler by the bedside. Those stuff do not scare me but make me feel safe. I tell myself that this time I can show my location more easily, but I won't live through such an incident again." (Interview D)*

Although 18 years have passed since the earthquake, it is possible to say based on these data obtained that its impacts still continue and individuals have instinctual habits from then. In addition to these habits, the participants were asked how would they define the psychological effects of the earthquake on them in order to understand how the participants were affected psychologically after the earthquake and how these effects are reflected today. The answers of Interview C and D to this question are as follows:

> *"We always fear that an earthquake may occur at any time. Although we do not speak of them, we have fears left from that time. For many years, I never wanted my children to stay elsewhere thinking I could not reach them in case of an earthquake. Now, I want them to notify me of anywhere they go. I am restless at all times, I learned to live with the idea of earthquake but I could not overcome my fear." (Interview C)*

> *"It is not quite possible to get over this incident psychologically. Because once you experience such a bad incident, it is not easy to forget. I lost my husband in the earthquake and my leg got injured during the earthquake because I remained trapped under the debris for 24 hours. These are the traces I will remember all my life. I am grateful that I survived but I can never forget the fear and the fuss I felt. Now when I go into a closed, narrow place or when I hear a very loud noise, my fear shows up again. We learned to live with what happened to us during the earthquake but this earthquake terribly affected us psychologically. I had never talked about it for 18 years; today is the first time I talk. I guess I had never been ready to face the truths until today." (Interview D)*

Requirements

It is very normal for individuals who stay away from their homes after the earthquake to have many needs. These needs may vary depending on the status of the people like age and health. When the general needs are considered, the participants were asked about

the needs arose after the earthquake. According to the data gathered, it was determined that the most needed things are clean drinking water, food, restroom, blanket to warm up and tent for shelter. Some of the answers of the participants to this question are as follows:

> *"We could not return to our houses for a long time after we left. We were afraid of aftershocks. I think one of the most important needs when outside was the restrooms. Then a place to shelter. A shelter is important as we used to stay on the street because we could not return our homes. For example, we settled in a park within the area. We erected out tent and even solved our toilet problem through our own means but not everyone was as lucky as we did. Not everyone had the enough material, stuff..." (Interview B)*

> *"Drinking water is very important, during that period many people got sick from the dirty water. Besides, the earthquake was on August, it was hot in the daytime but cold at night so we needed a place to shelter and blanket to warm up."(Interview A)*

> *"When I was rescued under the debris and got out, I was chilled; I was completely wet because they watered the location where I was under the debris with a hose. When I got out I needed cloths and a blanket. Then we needed water and food as our houses were demolished. Everyone was sharing what they had with others. It was very difficult to survive otherwise." (Interview D)*

After determining the needs in the interview, the participants were asked how did they fulfill their needs like food, beverage and water. When the answers given were reviewed, it was determined that they fulfilled their needs through their own means as the aids to the earthquake area delayed. The answers of Interview B, C and D to this question are as follows:

> *"Unfortunately the aids arrived very late. Therefore, we arranged everything through our own means; this included fulfilling our food and beverage needs. Those whose houses are standing went to their houses and gathered whatever they found. Nobody said "this is my food" or "these are my stuff" at that time. Those who had something shared them with those who didn't have anything. We managed like that until the aids arrived." (Interview B)*

> *"The aids arrived one week later so we solved many problems by ourselves. We fulfilled our own needs. Though the aids arrived failed to reach those in need fairly. People arranged whatever needed among themselves at that time." (Interview C)*

> *"We arranged everything we had ourselves. The aids arrived so late that everyone shared what they had with those who didn't have anything. Some people broke the locked market doors and took everything inside. I mean, I cannot blame them, I may not call this theft. Because when one needs something, he/she can unfortunately do anything all of a sudden." (Interview D)*

When the information obtained was considered, shelter holds an important place among the needs determined. Based on this, it is possible to say that shelter is one of the most important problems that needs to resolved after earthquakes is sheltering. For this reason, it is necessary to fulfill the sheltering needs of the people whose houses are collapsed, damaged or who may not return their home because of fear. The participants were asked how did they solve their shelter and heating problems in order to determine how they solved their sheltering problems at that time. According to the data gathered, earthquake victims erected the tents that they sheltered through their own means and created living spaces for themselves in the parks. Besides, based on what participants had told, settlement areas called "Çadı Kent" (tent city) which consisted of tents were established on free lands. As to the data obtained, it is possible that the living space of earthquake victims was the "Çadır Kent" for a long time after the earthquake. Some of the answers to the sheltering question are as follows:

> *"The reason we could not return our houses was because of the aftershocks one after another rather than the fear. Nobody wanted to be in a building at the quake. We erected our tent in the park and started to live there. If you ask me whether someone from the government helped us, I would say no. We did everything through our own means. And there was that Düzce Earthquake on 12th of November. In order not to live through the fear we felt while escaping, we did not enter our houses for so long, and lived in the tent we built." (Interview B)*

> *"We lived in a park in the neighborhood for some time as we could not return our houses. We erected our own tents, and turned the park into a living space as Nuran (Interview B) told. And we did all without any help from the government. But people who were not as lucky as we did had hard times about sheltering." (Interview C)*

As mentioned by Interview B, the aftershocks occurred following the main earthquake caused people to feel uneasy and avoid indoors. Besides based on these date, it is possible to say that people were even more shaken with Düzce Earthquake on the 12th of November short after the 1999 Earthquake on the 17th of August, and that a great sheltering problem occurred.

In addition to the sheltering problem, the participants stated that they solved the heating problem that occurred after the earthquake with the coats they found in the debris and with the blankets they got from the people around. Interview D, who told her experience after being removed from the debris, said:

> *"It was so cold when I finally got out of the debris. I felt even colder as my clothes were wet. My brother put a coat he found from debris on me, and he brought the blankets he found in the area for me to warm up. As you see, everyone warmed up on the streets through their own means." (Interview D)*

Help/Cooperation

It is possible to tell that help and cooperation issue is a topic frequently addressed among the data collected and it was a burning question after the earthquake. In this category the participants were asked how were the aids arrived after the earthquake supplied. According to the answers given, it was determined that there was a strong cooperation within the public but the aids from the government and the organizations were insufficient and late. Some of the answers of the participants on this matter are as follows:

> *"People were in a terrible condition, the aids had not reached the earthquake area yet. For one week, everyone tried to manage by their own means. In this way, cooperation was initiated in the region. Everyone helped each other ever since day one. People shared lots of cloths, food and beverage. Nobody said "I don't know that woman, I won't ask anything from her". We never thought of a feeling called hesitation. Everyone shared what they had with each other. We united to help those in need." (Interview A)*

> *"After the earthquake, I remember Necla (Interview E) helped me to fulfill my needs. She forgot herself and helped me as if she hadn't lived through any difficulties. She gave me a thick vest to put on to protect me from cold. I think people who saw me understood that I needed help. Many people helped me at that time. I still remember the caring approach of other people like Necla. People could say "She needs more than I do, I better give it to her". This is very meaningful." (Interview D)*

The participants emphasized the aids which were sent to the area but arrived late besides the cooperation, and they mentioned that the aids in the area were not distributed fairly. The statements of Interview C about this matter are as follows:

> *"Aids arrived 1 week late. There were toilet tissues, blankets, diapers in the aids, but if you ask me whether these were distributed fairly, all of us would say no. Most people in need could not even manage to reach the aids." (Interview A)*

> *"There was a lot of marauding at that time. There were people who saw and robbed the aid trucks on the road before even they reached the area. I had also seen people who collected the aids distributed although they did not need them. They literally made a stockpile. For example, packs of diapers were found in the house of an old lady who did not need them. Or there was a man who took 20 blankets although he didn't need them. Such things are very wrong but unfortunately true." (Interview E)*

With this statement of Interview E, it is understood that some aid trucks were robbed before even they reached the earthquake area and some people collected the aids even if they didn't need. This indicates that the organization for the distribution of the aids was not proper.

Informing / Education

When the informing and the education on earthquake category was reviewed, it was revealed that no information was provided about the possibility of an earthquake before 1999 Earthquake and that the society was not aware that they were under the risk of earthquake. Based on the data obtained, it was also understood that the society did not know what to do at the time of earthquake. In line with the answers given to the questions by the participants, it is possible to say that the authorities failed in educating the public and they disregarded the earthquake risk, which should not be forgotten.

In this category, the participants were asked to tell about the briefings on the earthquake risk before the earthquake. Some of the answers given are as follows:

> *"There was definitely no information. We didn't know we were under the risk of an earthquake. After all, everyone was shocked when the earthquake occurred because we were not expecting such a disaster."(Interview A)*

> *"There was no information. Experts acted if there were no such risk. The government made no warnings or notifications about a possible earthquake or to become prepared for an earthquake."(Interview B)*

> *"Before the earthquake, the earthquake subject was taught in the classes a little but it was not a subject emphasized. Anyway, it is not enough to teach it, its importance should be emphasized and the public should be warned if there is a risk of earthquake. If there had been a proper briefing, nobody would have caught unprepared." (Interview C)*

In the theorical part of the thesis, in addition to informing, the importance of educating the public about earthquake is mentioned many times. It is possible to say that being ignorant about earthquake causes more damage than the devastating effect of the earthquake. This result is supported with the data obtained from the interview. To obtain these data, the participants were asked what did they know about the things to do during and after a possible earthquake. While some participants claimed that there was no education, some of them said that the education provided was insufficient. The answer of Interview B to this question is as follows:

> *"Meetings were held at public education centers but the participation was very low. We don't like seminars or meetings at all as a society. We want to stay at home and be comfortable, and get informed. It is, of course, not possible to provide education in such a situation. Frankly speaking, the education was insufficient. Maybe if the way they provided information and the education were attractive, then the public might have been interested more."(Interview B)*

In addition to these statements, the answers of Interview A and D to this question are as follows:

> *"Informing is something done before the disaster, not at the time of disaster. They didn't told us there would be such a disaster nor explained us what to do in our country. For example, the Tüpraş fire started after the earthquake was announced at the time of fire and we were told to run. Where could we run at that moment. If we had known that there was such a risk in case of an earthquake and what we should do, we would have taken measures. Alright, we might be a little indifferent in such matters as a society, but they might have tried to educate the public somehow." (Interview A)*

> *"They did not organize a meeting where all the people might attend and listen. Education provided to certain people does not count. At the end, the only important thing is how many people were educated on this matter. What is important here is that the government should care about the public and educate them on earthquake. Whatever happened to us during earthquake was the result of our ignorance." (Interview D)*

It is possible to say that as well as the lack of education mentioned by the participants, the wrong information about the earthquake caused a lot of damages. Some of the misinformation about what to do during an earthquake, which is determined according the theory research, conducted and the data obtained in the interviews are as follows:

- Hiding under a table during earthquake
- Waiting under summers
- Staying still if you are caught by the earthquake in bed
- Waiting under the stairs

These data were obtained by the questions asked to the participants about the misinformation they had about earthquake. The answers of some participants are as follows:

> *"We had heard that hiding under a table during earthquake was correct, but it was wrong. There is a risk of crush when you hide under a table. On should wait near it but unfortunately we learned it afterwards." (Interview A)*

> *"They told us to stay still if you were caught by the earthquake in bed. We learned that it was such a nonsense idea after the injuries and deaths occurred after the earthquake. To my surprise, we should wait near the bed, not in it. There is a higher chance of survival when there is a safe gap near the bed." (Interview C)*

> *"The wrongest information was to wait under summers. We heard that people stood under summers crushed to death due to the collapsed ceilings. These are all because of misinformation. I am sure everybody thought summers were safe before the earthquake. I, for example, survived because I waited in fetal position near the armchair. The gap between the stuff creates a life triangle." (Interview D)*

> *"It is evident that the stairs are dangerous; many people trying to get out of the building by running down the stairs died when the stairs collapsed.*

> *There were also people waiting under the stairs. They told us later that the stairs were independent from the main building, and that the stairs might collapse even if the building stands. But we didn't know these that is why many people died where they nestled. Maybe, they might have survived if they stayed home." (Interview E).*

Upon determining the insufficient information provided to the society on earthquake, lack of education and the misinformation, the participants were asked of their ideas about the progress of earthquake education today. According to the data obtained, the participants think that the earthquake is forgotten today and that there are no sufficient informing or education on the matter. The opinion of Interview A on the matter is as follows:

> *"18 years passed and the experiences were forgotten. At least in the government side it is like that. But for the earthquake victims it is not possible to forget that moment. I mean, when we compared with the past, of course there are some studies. We are trying to do something individually but after all that time passed, the case loses its importance I guess. For example, those famous earthquake emergency bags are forgotten in some houses or they do not even exist anymore. Earthquake is quite an important matter, the public, especially the children should be educated on the matter; or at least it would be beneficial to correct the misinformation we have. But at the moment, I don't see great efforts other than those small endeavors. If an earthquake occurs, we may be affected even worse this time." (Interview A)*

Finally in this category, the participants, who highlighted the importance of children's education on earthquake, were asked about their thought on earthquake education in the schools. Some of the answers given are as follows:

> *"I think the information provided at the schools are insufficient. The children should be provided with a better education apart from learning what earthquake is in geography lessons and waiting under the table during earthquake. The children should know what exactly the earthquake is and what they should do." (Interview A)*

> *"The earthquake subject is taught in the schools because they are included in the curriculum. But I think this education is not enough. How can a child protect him/herself by technically knowing what earthquake is. If there are fun educational studies which may attract their attention, then they would learn willingly." (Interview B)*

> *"We experienced earthquake very closely, so we find what they taught in schools funny because they are insufficient. The children should learn to survive without their parents next to them. The time and place of earthquake is indefinite." (Interview D)*

Based on these answers, it is possible to tell that educations on earthquake in schools are insufficient today and the matter should be regarded more.

Crisis Period

In this category, the participants were asked how was the earthquake process managed. According to the data collected, it was understood that the post-earthquake crisis period was not managed good, and failure to make a proper and planned organization led to a chaos in the earthquake area. Earthquake victims argue that the chaos environment occurred arose from the organization problem. According to Interviewer A;

> *"We were not expecting that earthquake. We didn't know that we were under danger. It happened and we had no idea about what to do. I am glad that you were not in Gölcük at that moment because there was a big chaos on the streets. I still remember that horrified moment. People were screaming around, there were so many dead people on the streets; there were no electricity, no food, no water and no warm clothes. So basicly we had nothing when we left the house and we have seen a lot of horrible things. I can only blame the bad earthquake organization. They could do a better job. Human life is important." (Interview A)*

One of the problems that occur after earthquakes is security. The participants were asked about the security in the region. Based on the answers given by the participants, it was mentioned that the earthquake victims who could not enter their houses due to the fear of earthquake lived in parks and adopted tents as their homes for a long time; thus, that increased the robbery incidents. Burglary incidents during that period indicate that the security measures and the precautions against theft were insufficient. Besides, failure to correct the electricity interruption on time also triggered this problem. Below there are some parts from the statements of the participants, which may support this matter:

> *"After the earthquake we were afraid to go back to our apartments. So we lived in a tent for almost a year. I am happy that we had some parks around so we could build our tent. After some months those tents were become our home and we create our own living space there." (Interview B)*

> *"Some people left their apartments and lived in tents. I think after that all the security problems have started. Police were also busy to help other people because there were so many people get trapped under debris. There was a power cut for a long time and a lot of houses were robbed at that time. That's so bad!" (Interview E)*

After an earthquake, disaster management departments should fulfill the basic needs of earthquake victims. Especially for the victims who may not return their homes is urgent. Based on this, the participants were asked how their needs like food and water were fulfilled during the disaster management process. When the answers are reviewed, it is seen that these needs were not fulfilled sufficiently. As it was stated by Interview E:

> *"There were so many things we needed at that moment. But the most important things were food and drinkable water because we couldn't go to our apartment to have them. There was no good organization in the city to provide those things for us. We were waiting so long but at the end we had to find by ourself till the help supplies arrived to the city." (Interview E)*

The statements of Interview A supports the aforementioned insufficient aids.

> *"All the help supplies arrived to the area after one week. It was so hard to find food and drinkable water. I wish they could send those supplies when the earthquake hits Gölcük." (Interview A)*

Another topic addressed under crisis period is the healthcare services in the region. When the participants were asked to make comments on the healthcare services provided, it came up that besides many injured people after the earthquake, there were many people who managed to survive but who were sick and needed help. According to the participants there were no uninterrupted healthcare service and it was determined that the medical teams arrived for help were insufficient. Although one of the most important needs after disasters is health, the injured people were not intervened in a planned manner and it was not possible to overcome this period easily due to the insufficiency of the medical personnel. Interviews C and D mentioned about some of their experiences as follows:

> *"The streets were full of with injured people. There were doctors and nurses everywhere but in my opinion they were not enough to help. Because there were so many collapse buildings and you can imagine how many people needed help at that moment. It is so sad to say but the government were not prepared for that disaster." (Interview C)*

> *"There were so many sick and old people around. They all needed help. I helped some of the old people but I am not a professional so I couldn't do a lot. The numbers of the doctors were not enough to help everyone. And actually, even if you are healthy, you can get sick easily after an earthquake, now we know i.t" (Interview B)*

When the comments of the participants about the psychological services were analyzed, it was understood that there were not enough doctors in the region for such services and that most of the victims were left alone in terms of psychological support. As it was stated by Interview F;

> *"There were many people suffering for losing their relatives. We were also frightened very much and in panic. We tried to heal and calm ourselves down. As the roads were blocked, the aids and the doctors arrived the region in difficulty. They were inadequate in calming people down and treating them..."(Interview F)*

As it is also mentioned in the sources reviewed in the theory section, trauma, which occurs after the earthquake, is very common among people who lost their relatives in an earthquake and it is possible to say that a person may only overcome these psychological traumas through professional assistance. Besides, according to the statements of Interview F, the fear and the panic experienced by the people after the earthquake may lead to several problems and the psychological services should be emphasized more to pre-

vent this and the number of people assigned should be enough to fulfill the needs of the earthquake victims.

It is very important to reach people waiting to be rescued under debris on time. Therefore, it is possible to say that on top of the problems that need to be resolved after earthquakes there should be the search and rescue operations. According to the official records, there were 18,000 deaths and 25,000 injured in 1999 Earthquake (cf. Sözcü, online). These numbers show the dimension of the devastation that the earthquake caused. According to the data obtained during the interview with the participants, it is understood that there were search and rescue operation conducted in the region but these operations hardly progressed due to electricity interruption. The statements of Interview E on the matter are:

> *"After the earthquake Izmit/Gölcük was demolished. There were searches everywhere. Some people were searching for their families through their own means while some other ran to collapsed buildings with shovels to help people. There were also the rescue teams but, of course, their numbers were not sufficient. Their job was also difficult because they were trying to rescue people trapped under buildings with 8-9 floors. Not an easy thing to do. They needed to be very careful. The darkness due to the lack of electricity made it harder. Therefore, the operations were not easy. To tell the truth they did their best; aids from all over the world arrived to the region. More people were rescued by that means. I mean, lack of sufficient numbers of rescue teams made things harder…" (Interview E)*

According to the participants, the greatest problem at the time of and after the earthquake was the lack of organization and the ignorance about earthquake. The statements of Interview E and Interview A on this matter are as follows:

> *"Nothing was organized. Nobody knew what to do. There was a total chaos in the region. The help didn't arrive on time and there were no gathering points. So, what could those people do in that case…" (Interview E)*

> *"There as nothing as organization. Everyone was trying to do something by their own but the people were ignorant about earthquake; therefore, what was right and what was wrong is open to question. Aids, which did not arrive, were a great problem. It is true that search and rescue operations are very important but without the aids how might those people survive... The ignorance of the people and being inexperiences led to chaos in the region. Maybe, because of this we got over it very difficultly..." (Interview A)*

Based on these data, it is possible to say that it is necessary to be prepared for a possible earthquake by informing the public on earthquake and better organizing the disaster management departments. According to the data obtained, it is seen that the combination of people unaware of what to do after the earthquake and the lack of organization in the region led to a great chaos.

Following the interview made with the participants on how the crisis process was conducted and the problems occurred during that period, they were asked about their solution recommendations on how to eliminate these problems. Some of the answers given to this question are as follows:

> *"The government and the relief agencies should be organized better. To prevent a chaos environment, they need to plan what should be done in an earthquake. Besides, they should educate the people on this matter. Everything happened was caused by ignorance. Above all, of course, they should build durable buildings. They risk our lives by stealing materials." (Interview A)*

> *"There should be gathering areas and first the toilet problem should be solved there. At that time we didn't have a toilet and it was so difficult and it invites diseases. They should define the different needs of the people according to age, medical status and sex, and keep them available in these gathering areas. For example, a building called Hangar was built in Yalova. It is arranged to fulfill the needs in an earthquake. But I am not sure how sufficient this would be. There should be more of such places." (Interview B)*

> *"The society, particularly the children, should be educated. People should know what earthquake is and what he/she may do. Besides, things to do and things to be avoided during and earthquake should be avoided. Since it is hard to make a countrywide organization, then let them educate the society so that people gain consciousness against the next earthquake." (Interview D)*

Being prepared

When the answers given to the questions in preparedness category were reviewed, it was understood that the participants never thought of the possibility of 1999 Earthquake and they were not prepared for that earthquake. The answers of some participants about the matter are as follows:

> *"We were not prepared for this earthquake personally or as a society. I think this is the reason for all the problems occurred after the earthquake. We were not prepared neither in terms of conditions nor feelings." (Interview B)*

> *"Never! We were not prepared for that earthquake. After all, the reasons for such a chaos were its occurrence at an unexpected moment and us facing an incident we never knew." (Interview D)*

> *"When I think of what happened, we were not prepared for such a disaster. We didn't know what to do." (Interview C)*

To overcome the natural disasters with devastating results like earthquake with minimum damage, it is important to inform the society on the matter. With this information, people

may do some preparations for protection from earthquake and they may put themselves under protection. According to the data obtained from the research conducted, it is seen that not only the individuals but also the overall society, government units and even the relief agencies were not prepared for that earthquake.

During the interview, it was emphasized that after the 1999 Earthquake, many television and radio channels informed people about earthquake and the things that should be done during an earthquake to avoid repeating the mistakes done in this earthquake. The participants mentioned that those informative broadcasts continued for a certain time but then ended, and they think that providing such information from time to time would bring an earthquake consciousness to the society. They stated that people should somehow notice the importance of the matter and thus people may be prepared for a possible earthquake.

In addition to the information, there had been a preparation period under the name of "the earthquake bag" after the earthquake. During that period, the earthquake experts who emphasized that there should definitely be an earthquake bag in every home participated to certain broadcastings to raise awareness in the society. Based on this, the participants were asked about the earthquake bags they prepared after 1999 Earthquake. According to the answers given, it was understood that those earthquake bags were forgotten and for the moment they do not have a go bag ready. The answers of the participants to this question are as follows:

> *"I don't have a bag but I always keep a torch and a whistler by the bedside. I think these are my only preparations for an earthquake." (Interview A)*

> *"My bag used to be ready at all times but one day I realized that everything shrank and spoiled. It is not enough to prepare, that bag should be renewed constantly." (Interview B)*

> *"I don't have an earthquake bag now. Those days, some municipalities distributed small earthquake bags. There was a torch, a whistler and water in it. Actually such practices are reasonable but I am not sure how beneficial would be a bag with one bottle of water for each house; at last we are not living single in a house. Though we were in such a position that I can say it is better than nothing." (Interview C)*

> *"Earthquake is a matter that should not be forgotten. The sufferings should be remembered so that we are not caught by the next earthquake unprepared. I think earthquake bags are among those things forgotten long ago. Yet, it is another issue to remember the bag while escaping the house in panic at the time of earthquake, but being prepared anyway makes a person feel safe." (Interview D)*

> *"Personally I have nothing but a torch by my bedside. I don't have a bag available. I mean, I couldn't leave the house due to its durability. If I*

> *could get out, I think I would have saved myself. It is also hard to remember the bag with the fear." (Interview E)*

Knowing how to act in earthquakes may help preventing many damages which can occur. Practices like rearranging the house in compliance with the earthquake, determining the safe areas within the house, people aware of what they should do at the time of earthquake and determining the escape points would help people to protect themselves at the time of earthquake. Based on this, the participants were asked about their thoughts on earthquake drills and arranging their houses in compliance with earthquake.

Pursuant to the answers given, it was determined that these ideas are reasonable and that these practices might help them in during a possible earthquake. Besides, during the interview participants mentioned that they had never thought of such practices and no one warned them about these matters. Some of the answers of the participants to this question are given below as example.

> *"I wish we knew these practices before the earthquake. Maybe then there would not be so many deaths and injured. It is very logical to determine the escape points because my biggest problem had been leaving the building with my children." (Interview B)*

> *"I think earthquake drill should be performed with the children, so that they learn about this matter and know what to do when they are not with their parents. The place and time of the earthquake are indefinite, so I think it is very important to raise the awareness of our children." (Interview C)*

> *"I am living in earthquake residences built by the government for earthquake victims as my house collapsed during the earthquake. Most of the stuff at home is designed and arranged in compliance with earthquake risk. Therefore I feel myself safer. I think everyone should allocate a free day for re-arranging their home for earthquake. One day they spent may save their lives." (Interview D)*

As the last question in this category the participants were asked whether they were prepared for a possible earthquake. The collected data indicated that having an earthquake experience does not mean being prepared for the next earthquake. Some of the answers given are as follows:

> *"We are experienced as we lived through an earthquake before but we are definitely not prepared. Nobody works on this matter for us to be prepared. If there were actions towards making the society conscious, maybe we could be prepared for the next earthquake." (Interview E)*

> *"We are not prepared for the next earthquake. If an earthquake occurs, we may face a greater chaos than the previous one." (Interview C)*

> *"Personally, I have some preparations but I am not sure how much would they protect us. But as a society we are definitely not ready for the next earthquake." (Interview A)*

10.5 Insights

The results based on the findings of this study including the qualitative analysis of earthquake experiences of earthquake victims who lived through 1999 Marmara Earthquake are given below.

The earthquake victims participated the researched experienced the 1999 Earthquake at the main center and this allowed the results obtained to be more sound and reliable. Although the participants experienced the earthquake in different ways, the answers they had given to the questions determined that they share the same opinion about the problems and the deficiencies. During the interview the participants answered 26 open-ended questions. Some of these questions were edited by the interviewed based on the course of the interview.

When the data obtained from the study findings are reviewed, the feelings the participants had at the moment of and after the earthquake were fuss, panic, fear, shock and despair, and it was determined that these feelings which may lead to a trauma continued even years later. The reasons for the bad memories and the people to feel desperate in the face of earthquake may be indicated as being unprepared for an earthquake and lack of information about earthquake.

Better informing the children and their families about earthquake may help to resolve the problems, which may occur during a possible earthquake. Besides, if a person has the information to protect him/herself, then he/she can protect him/herself and his/her family against the dangers and mitigate the possible damages. It is very important for an individual to educate him/herself about what to do before, during and after the earthquake. Therefore, it is necessary to give more importance to the trainings on earthquake.

Another outcome of the findings is that the disaster management plan in 1999 Earthquake did not run properly and there was a lack of organization in the region. The lack of organization and plan highlighted by the participants were understood to be the leading reasons of the problems occurred in the earthquake. Indeed, a "Disaster Management Plan" prepared properly and practiced for several times may mitigate the problems which may occur in the next earthquake. For this, the government, municipalities and the earthquake experts need to conduct a joint study and produce solutions. They particularly need to make a proper plan for the needs by listing the basic needs arose after the earthquake. By this way, the crisis may be overcome more easily and the victims would feel themselves safe.

As a result, the findings of this research includes the review of the incidents encountered during the earthquake and the problems detected associated with these incidents by the

people who experienced the earthquake. The more the society is informed about the earthquake, which is a topic to be remembered at all times, the stronger the individuals may be in face of the earthquake and thus, the organizations and people in charge during an earthquake may proceed more easily. Therefore, actions should be taken to bring importance to the earthquake in the society.

11 Survey of 7th Graders from Ahmed Şimşek College

11.1 Aim of the Research

The purpose of the research is to analyze the "earthquake" concept on children who has not experienced earthquake yet and to investigate the factors, which may pose a risk in the future.

11.2 Research Method

In the theory part of the research, it is mentioned that the approach of the adults and the children towards traumatic incidents are different. Based on this, to make an addition to the interviews with adults on earthquake, it was decided to analyze the thoughts and responses of the children too.

In this part of the research, a qualitative analysis was conducted to determine the information the children attending to secondary school who has not yet experienced earthquake had. It was intended to determine the approach of the children towards earthquake concept and their general knowledge on the matter. In the study, it was focused on gathering texts and visual materials as data and analyzing them.

Like written materials, the visual materials used in the researches are also covered in document review within the scope of qualitative researches and they may be used in qualitative researches. Such materials may be used as additional data source together with data collection methods like interview and observation review, and they may also be the data source of a research by their own (cf. Yıldırım, Şimşek 2006). On this basis, in this part of the research, pictures are preferred as visual data source.

In this research, typical case sampling, which is included in the scope of qualitative researches and which is one of the purposive sampling methods, was used. The researcher randomly selected the school, which would constitute the study group among the secondary schools in Kadıköy region which has the properties to reflect the general situation. Teachers at the school were contacted and the study group constituted of fourteen 7th grade subjects studying in Ahmed Şimşek School, Kadıköy, Istanbul during fall semester of 2017-2018 school year. There were ten male and four female students all of which were thirteen years old.

A picture that is a visual data source and a child are the facts that accomplish each other. A picture drawn by a child reflects the thoughts, feelings, experiences of the child and what is important for the child. A child reflects the world he/she perceived to pictures and this reveals products about the child's development level, trauma experience, fears and family structure. Therefore, interpreting the pictures drawn by the child aims to show the perspective of the child on life and incidents beyond revealing what is not in the picture and the unknown (cf. Savaş 2014, 15).

In the research, the students were asked to reply the questions asked by drawing a picture to determine how would they reflect the "earthquake" concept by using their imagination, and the visual materials were collected as data. Then, in addition to the study, the researcher conducted a brief meeting with the students about preparation for earthquake. In the conclusion part, the findings are interpreted in a personal manner in compliance with qualitative method.

11.3 Organaizing the Survey

This study was conducted in 7D class in Ahmed Şimşek College on a day when disasters were taught a lesson by making a pre-meeting with the English teacher of 7th grade students. Before the teacher explained earthquake, the students were asked to reply "what occurs to you when it comes to earthquake?" and the teacher distributed the plain white papers and colored pens to the students from the setting prepared. In this study which lasted thirty minutes, the researcher observed the students while they answered the question to analyze how they approached the matter, their activity and attention. Because the occurrence of the product concerned the researcher as much as the outcome.

11.4 Analyses

In this part, the findings obtained from the visual data of the research are given and it is aimed to make sense out of the collected visual material in form of text and image. In this study focusing on earthquake concept in children's eyes, it was intended to determine how prepared were the children for a possible earthquake as a result of the meeting conducted in addition to the visual materials.
Pictures, which are used as data in this study, are tools to expose the inner world and the mentality of a person. The personality is reflected through picture, which is a communication tool. A picture that does not only consist of technical skills helps the emergence of an individual's capability in transferring information. A child reflects his/her spiritual experiences, feelings and thoughts through the pictures he/she draws without realizing. Therefore, analyzing the pictures drawn by a child helps understanding his/her thoughts (cf. Savaş 2014, 3).

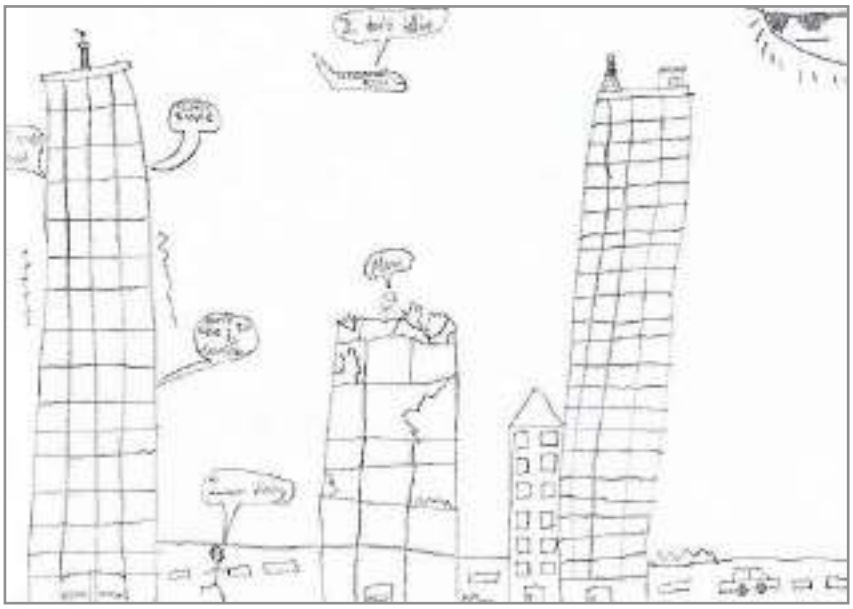

Figure 10: Earthquake concept from child's perspective (Tarık Emre Şükür)

In Figure 10, the student highlights that the earthquake he/she imagined in the city center is approaching and that the society is under pain of death. While there are no damages in higher buildings in the drawing, there are fractures in the low-rise building due to earthquake. The note "earthquake is not good," added to back of the picture indicates that the individual has not experienced earthquake but he is aware of its existence and that he/she knows that it is an evil and dangerous incident. The child reflected his/her fear at the moment of earthquake with an unhappy child exclaiming to call his/her mother, a human figure running on the street shouting, "I'm dying", and the words expressing fear and surprise. Besides, with the sun drawn, it is understood that the student still has hope.

Figure 11: Earthquake concept from child's perspective (Efe Küçüksolak)

In Figure 11, two house figures are seen. The higher building on the right inclined towards left and it is about to collapse. The house drawn to the left the building is heavily damaged but not yet collapsed. The absence of roads leading to the buildings refers that the houses are abandoned and there is no one living inside. It is seen that the people scared of the earthquake and ran are gathered in the red colored Red Crescent tents drawn in the middle of the paper. It is possible to understand that people there are unhappy and full of fear from the faces drawn by the child. The trees tumbled down indicate that it was a great earthquake and the rain refers that everyone including the nature cries for this incident. The ambulance trying to go on the rough road intends to explain that earthquake victims would need it and there may be deaths and injuries in the region. With the note on the back of the drawing saying "I hate earthquake, I hope God bless earth", he indicated that he is afraid of the earthquake and that he/she will ask for God's help at the moment of earthquake.

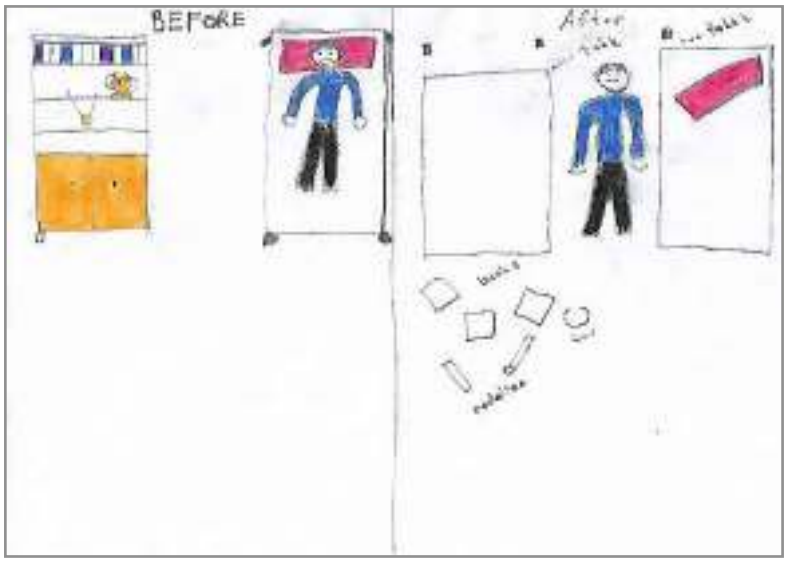

Figure 12: Earthquake concept from child's perspective (Osmantan Aras)

In Figure 12, the student drew that he was caught to earthquake at home. The child, who referred to the before and after of the earthquake, mentioned that there were loud noises during earthquake and that the person experienced the earthquake was sad. With the note he/she added to the back of the picture saying, "*Earthquake is one of the most dangerous natural disaster. We should pay attention to it",* he mentions that he/she knows what earthquake is and that this matter should be regarded. In the picture we also see that the person normally lying on the bed fell off after the earthquake and the objects in the bookcase scattered around. Here, it is possible to understand that the e-arthquake has a dispersing and devastating power.

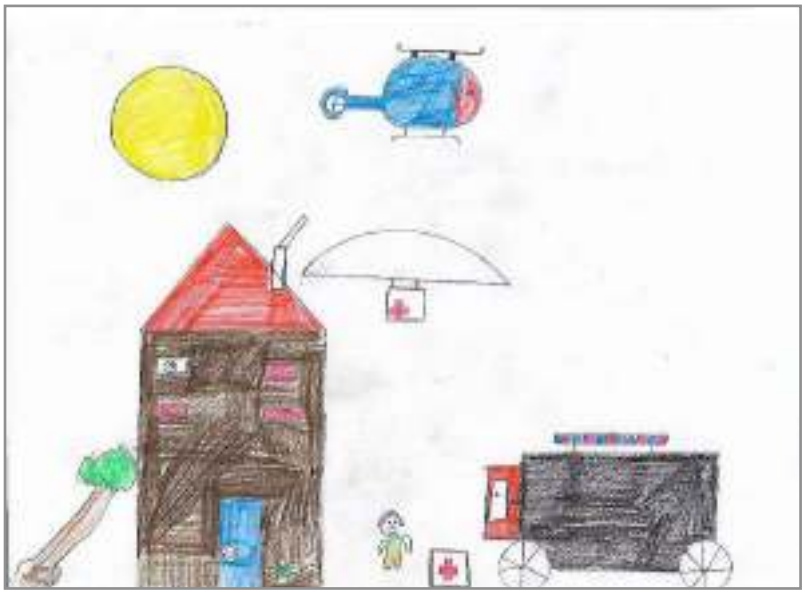

Figure 13: Earthquake concept from child's perspective (Emre Sağnak)

In Figure 13, the house, tree, people, ambulance and helicopter figures are seen. In the drawing, the house has not tumbled down because of the earthquake but there is a human figure who was stuck in the building. It is possible to say that this person expects help from outside. The participant may intended to tell that there are injured people around the building by drawing a human figure fell towards right in the vicinity of the building. With the helicopter, ambulance and first aid packages, he referred to the aids arriving the region and he might have emphasized the greatness of the earthquake with the tree inclined right at the left lower corner of the picture. It is understood from the sun and the happy human figures in the picture that the participant does not lose his hope despite the disasters. The participant mentioned that he is scared of earthquake with the "*earthquake is very scary"* note.

Figure 14: Earthquake concept from child's perspective (Ali Özarslan)

In Figure 14 there are four cars trying to move away from the incident area. It is possible to understand this from the position the vehicles are facing. There is chaos around a collapsed building caused by many people in fear, panic and hurry. The red color on the ground represents the wreckage occurred around. The child is aware that earthquake leads to deaths. The child, who drew people caught by the earthquake inside the building, thinks that people should protect their heads and hide under a table at the moment of an earthquake. From the facial expressions here we may understand that the people caught by the earthquake at home are more unhappy and scared than those outside. The student mentioned how the concept of earthquake frightened him by saying "earthquake makes me feel afraid".

Figure 15: Earthquake concept from child's perspective (Umut Toputan)

The irregularity and the moving of the earth in Figure 15 was pictured as an effect of the earthquake. Here, the earthquake not only damages the buildings but also the roads. In the left side of the picture, there is a building collapsing towards left and a winch arrived for help. Besides, people drawn on the upper floors of the collapsed buildings indicate that the student thinks the garrets are more robust than the ground floor and during the earthquake it is necessary to run to those areas and ask for help. The ambulance and the people with hands up and dressed in same color are considered to come to the incident area for help. Like in Figure 10 and Figure 13, the child indicates that he still has hope with the sun he drew despite the devastated city. With the note*"earthquake don't kill, weak buildings kill people",* the student mentioned that the earthquake is indeed a natural incident and the weakness of the buildings constructed may lead to the death of people.

Figure 16: Earthquake concept from child's perspective (Emre Bolelli)

In Figure 16, two house figures damaged from the earthquake attract attention. One of the houses has tipped to one side and the other one is rocking. In this drawing there is a man drawn on the attic to escape from the rocking building like in Figure 15. With the figures drawn in the picture, the student wanted to tell that the person on the attic cried for help, the relief helicopter flied about the region and tried to help people stuck in the buildings during the earthquake. A bleeding person is lying on the road. This was drawn to tell that there were people around who died during the earthquake. Besides, there is an ambulance on the road and a Red Crescent tent by the roadside. This describes that there is need for aid in the region. The child gathers the Red Crescent, ambulance and helicopter relieves under the same heading by using the Red Crescent figure on all aid equipment in the picture. Like in Figure 15, with the note indicating *"The killer is not earthquake, killer is bad buildings",* the student wanted to emphasize that buildings may kill people.

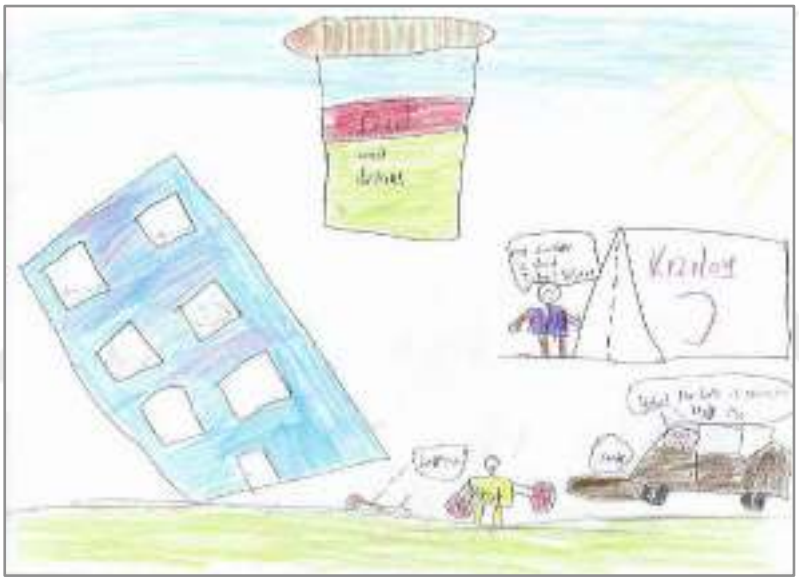

Figure 17: Earthquake concept from child's perspective (Mustafa Şanlı)

In Figure 17, there is a building figure bent towards left. It is thought that the figure with blood drawn under the building refers to a person trapped under the debris and asking for help. When the picture is analyzed it is understood that Red Crescent and Akut aid teams arrived to the region; an Akut member carried the aid cases, a Red Crescent tent was erected in the earthquake region, and food and beverage aids were distributed from the helicopter. In the picture we see that there is a sad mother in front of the tent who is in shock for loosing her daughter and who cannot believe what has happened. With these figures and writings, the student wanted to tell the devastating side of the e-arthquake and the aids sent to the region after the earthquake. In the lower right corner, there is a man who was driving at the time of earthquake and who could not exactly understand what had happened, and he is asking for help dreadingly. The student intended to emphasize how dangerous the earthquake is with his/her note on the drawing saying, *"earthquake is the worst natural disaster in the world".*

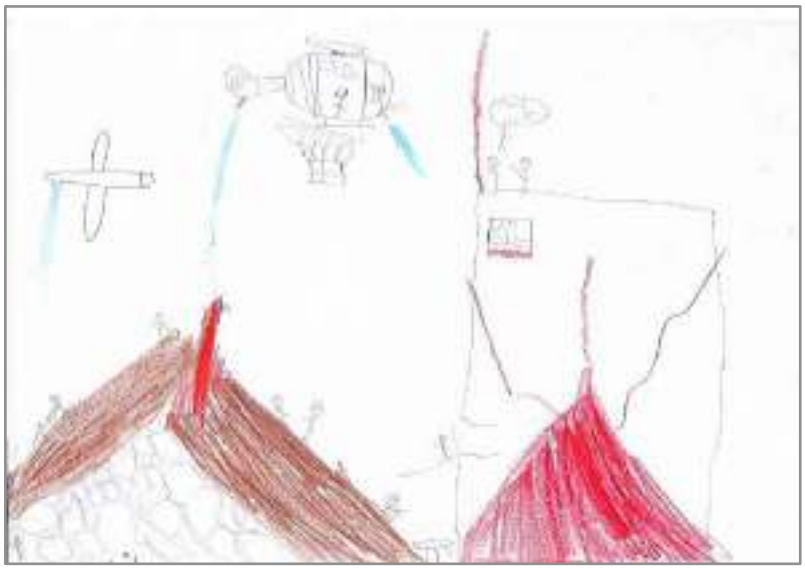

Figure 18: Earthquake concept from child's perspective (Emir Gençaslan)

In Figure 18, there is a building to the right of the picture, which was damaged in the earthquake. The red figure on the building and on the window of the building was drawn to tell the fire occurred after the earthquake. The child intended to state that the attic is safer and the fire should be avoided by drawing human figures climbing to the attic. On the left of the picture there are two buildings collapsed one on top of the other. It is also seen that people are running around and trying to escape from the fire, which arouse from this collision. To extinguish these fires, one helicopter and a plane arrived and try to help people by discharging water from above.

The student made an explanation saying *"earthquake is a killer, you can say I never saw earthquake but other countries saw"* and this shows that he knows that earthquake is a killer and that never experiencing an earthquake does not mean that it does not exist. It is likely that he/she thinks there had been no earthquakes in Turkey, which is the country he resides with "Other countries saw" expression.

Figure 19: Earthquake concept from child's perspective (Nilay Uygunoğlu)

In Figure 19, the student drew a house damaged during the earthquake. In this picture where the windows and the door is broken and the walls are damaged, a person who was trapped in the house during the earthquake is asking for help. Besides, the electricity pole fell on the house reflects that anything is possible at the time of earthquake.
"Earthquake is bad because we might die" note refers that the student knows there is a risk of death due to earthquake and that she is afraid of it.

Figure 20: Earthquake concept from child's perspective (Nilay Yıldırım)

In Figure 20, there is an overall chaos dominant. In the picture, there are three house figures damages and a mother trying to get out of the house in the middle. An environment where people outside the houses are screaming in panic and ask for help was depicted. With the human figure waiting to help people at Red Crescent tents and inviting them to the tents, he student intended to tell that Red Crescent provides help and it is the place to shelter in earthquake. Besides, the bended bodies of the trees and the head of a person trapped in the 3rd house from right reflect the devastating effects of the earthquake. With the note about earthquake saying, "we need help!" the student states that people do not have any preparations to protect themselves at the time of earthquake and everyone needs help.

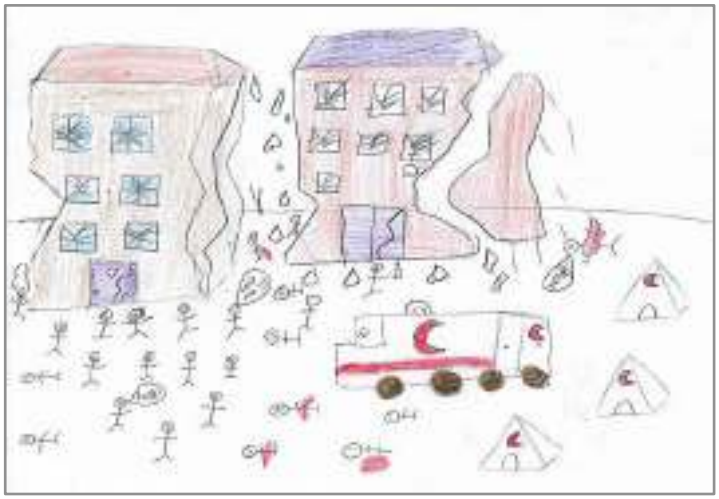

Figure 21: Earthquake concept from child's perspective (İdil Cemre Örem)

When the picture drawn by the student in Figure 21 is analyzed, the chaos environment created by the earthquake is seen. The broken windows and the cracked walls of the buildings drawn in the picture reflect the devastating effect of the earthquake. The pieces falling on the human figures from collapsing buildings indicates that there are deaths and injuries in the region. There are human figures crying out as "help" on the street with panic and there are many death and injured people in this earthquake scene created. It is possible that the student intended to tell that there would be too much loss of life and property after earthquake. There are also Red Crescent tents in the lower right corner of the picture and an ambulance close to the tents. These figures aim to show the source of the aids at the incident area. When the general picture is considered, the child described the moment of fear, terror and panic with collapsed buildings, death and injured people figures. She emphasized that earthquake is an evil incident with the note "earthquake is so bad" on the back of the picture.

Figure 22: Earthquake concept from child's perspective (Azra Çamuşcu)

In Figure 22, the earthquake scene is located by the sea. In the picture, the yellow building stands but its door and all of its windows are broken. The broken glass pieces refer that the pieces of the broken glasses scattered all around. It is understood that the person trapped inside the building asks for help by saying, "help me". Besides, there is a Red Crescent tent drawn to the right and someone who lit a fire next to it. In the middle of the picture, two people are carrying an injured to the ambulance on a stretcher. Red Crescent and ambulance figures refer to the relief works in the region. With the *"God bless people, but you should build safe buildings"* sentence of the student, it is mentioned that some dangers may be overcome through precautions.

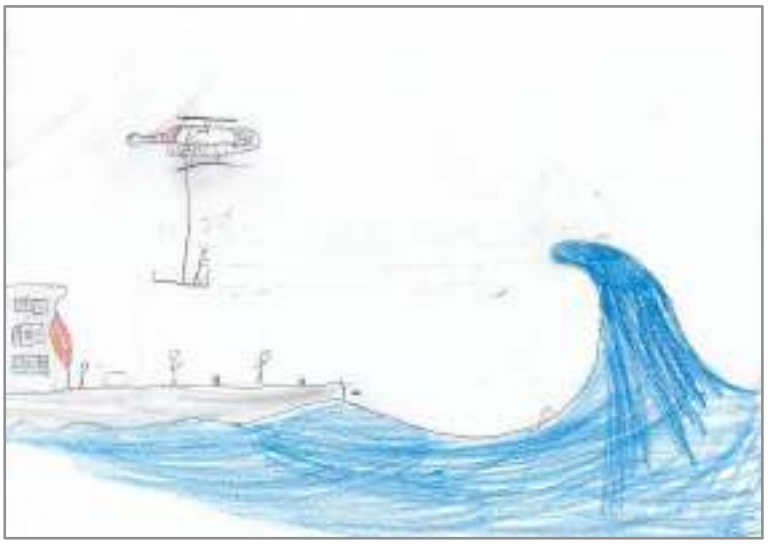

Figure 23: Earthquake concept from child's perspective (Denizhan Enginler)

In Figure 23, the student tried to depict a tsunami with the extreme wave drawn. It is possible to understand from the size of the wave drawn and from the human figures in panic that this natural event occurs after earthquake is dangerous. In the left corner of the picture we see that a fire started in a damaged building and that the people are stuck between the waves and the fire. The yellow and red colors used here refer to the fire. Another figure that attracts attention in the picture is the Akut helicopter coming to help. The student noted "attention! After earthquake comes tsunami" on the picture he drew and indicated that he/she wanted to emphasize tsunami and that attention should be paid to it.

In the observations made during drawing, most of the participants were determined to do the required work comfortably while some participants flapped as if they could not deliver on time. When the eager of the participants to contribute in the research is considered, it is possible to say that the study was conducted in a happy and a peaceful class environment. As a result, the participants completed their pictures without getting help from each other. Thus, it was possible to analyze the results accurately and individually.

In addition to the study, the researcher obtained some data from the 15-minute meeting after collecting the pictures to understand how ready the participants are for an e-arthquake. Some answers from the meeting are given below as an example:

> *"I know what is earthquake but we are not ready for an earthquake at home. I don't know what to do if an earthquake happens. Maybe they should also teach us what to do or I can ask my parents. But maybe they don't think that it is so important…" (Emir Gençaslan)*

> *"Earthquake is dangerous. We might die because of that. And I don't know what should I do if it happens. Maybe hiding under a table would keep me*

alive. I don't know. Why didn't we learn anything about it? I don't feel safe…" (İdil Cemre Örem)

"If any earthquake happens, we better wait the Akut or someone who knows what to do. Because I don't know what do I have to do. Maybe my parents know but I am not sure because we never talk about it." (Ali Özarslan)

"I know that I have to wait at home till the earthquake pass and later I have to go outside with my parents to be more safe. That's what my parents told me. Maybe they are ready for the next earthquake but I would like to be ready too. Right now I don't feel so safe…" (Denizhan Enginler)

When the responses to the "are we prepared for an earthquake?" question asked to the participants after the drawings were analyzed, it was determined that the participants knew about the earthquake concept but they were not prepared for a possible earthquake. Based on what they told after the meeting, it was revealed that their families were not prepared for a possible earthquake either.

11.5 Insights

The results based on the findings of this study including the qualitative analysis of earthquake perception of 7th grade secondary school students are given below.

Earthquake particularly concerns people living in earthquake zones. Although it seems simple to teach earthquake, which is a natural disaster in classes, the students who has not yet experienced earthquake should not be expected to give the required importance to the matter. Because, individuals who have not yet experienced an earthquake and who think that they won't go through an earthquake do not care about it. This thought is one of the problems that make earthquake education harder.

According to the data obtained in line with the study findings, participants created 14 drawings about the earthquake concept. The pictures drawn by children give clues about their inner world and cast of mind. This is because children draw what they think rather than what they saw (cf. Savaş 2014, 108).

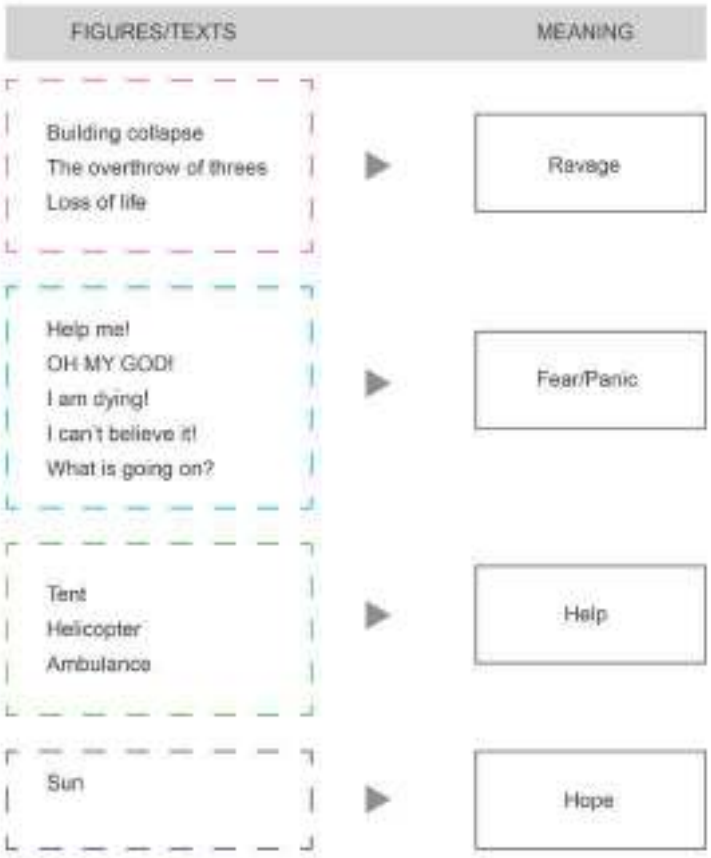

Table 11: Color-coding illustration of drawings (own graphic)

In the analysis of this study conducted by fourteen participants, it is seen that earthquake is generally perceived as a detrimental and dangerous incident. In Figure 1, the meanings of the figures and texts used on the pictures are shown. Accordingly, when the earthquake scenes created in the drawings of the participants are considered, it is seen that what was reflected the most in figures are feelings like fear and panic, loss of live and property, injuries, Red Crescent and calls for help. Imagining the bad things that may be experienced and being desperate in the face of an earthquake by the participants who never experienced earthquake indicate that they are aware of the damages of an earthquake. Based on this, it was understood that the knowledge of the participants about the earthquake concept discussed in the school and within the family is that earthquake is a devastating incident and the disaster, which may occur after an earthquake. In the meeting conducted after the drawings it was determined that the participants know what earthquake is but they are not prepared for a possible earthquake.

As a result, the findings of this research give clues about how the students who have not experienced earthquake before perceive the earthquake concept. This study would assist in revealing the current problems by being used as a good research tool. While the earthquakes, which are unavoidable natural disasters, are being taught in the classes, it is necessary to taught students how they should protect themselves as well as the damages, which may occur during an earthquake. This education is important for the children

to feel themselves safe even when they are far from their families as the place and the time of the earthquake are indefinite. Thus, the mistakes in the perception of a natural disaster with great devastating effects like earthquake may be eliminated. There are too much loss of life and property after earthquakes due to fear, panic and ignorance. It is possible to mitigate these losses bu correcting the known mistakes and giving importance to earthquake education.

12 Conclusion of Empiricism

In this chapter of the study, the assumptions directing the research are reviewed in line with the data obtained from the interviews and survey conducted, and the results are given below.

According to the data obtained, it is seen that Istanbul, which has a high earthquake risk is not socially prepared for a possible earthquake. It was understood that the having experienced the 1999 Marmara Earthquake did not affect the preparations of the earthquake victims for the next earthquake. This is because the society has no individual preparations for damage mitigation and the agencies have no proper disaster management plan. Therefore, there is a relation between the proper planning of disaster management and the society feeling secure.

As a result of the interviews conducted, it was determined that people do not have much information about earthquake and for this reason they are afraid of the earthquake and anxious about future. The participants mentioned that before the earthquake, they didn't know it was possible to get over the earthquake, which is considered as a terrifying incident, with less damage through the preparations to be performed. Based on this, it may be indicated that it is possible to minimize the feelings like fear, panic and anxiety by increasing the awareness on earthquake in the society. It is beneficial to raise this awareness before an earthquake.

In the survey conducted in addition to the interviews, it was understood that the children who had never experienced earthquake were afraid of earthquake and they thought they might not survive in case of an earthquake. This is because children do not have sufficient knowledge about earthquake. Besides, it is possible to say that, because of the lack of information of parents about earthquake, there is a direct relation between the children being unprepared for an earthquake and being afraid of it. As the children feed their feeling of safety in cases of risk over their parents, they are significantly affected by the attitudes and decisions of their parents. Therefore, it may be told that the children of families who fear earthquake and lack sufficient information also afraid of earthquake. If the families educate themselves about earthquake, this will favorably affect the psychology of their children in cases of risk.

According to the data obtained, today there is a relation between not caring enough about earthquake education in schools and the knowledge of students about earthquake. So, the importance of providing the required education about earthquake at school as well as domestic awareness is obvious. Especially as children at school age spend more time outside home due to school and similar activities, it is possible to say that they open to information and learning. For this reason, earthquake education given to the children at schools should be valued. Although this is a time-consuming approach, developing the education system at schools will help mitigating many problems.

When the issue of education of children is reviewed, according to Prensky (2001), learning requires effort and for this, it is important that children want to learn voluntarily. Therefore, if it is intended to educate children on such a terrifying matter like earthquake, it is necessary to motivate them and ensure their participation to learning activities (cf. Prensky 2001). Studies may be conducted on the subjects intended to be taught about earthquake by developing different and fun methods.

When the hypothesis claiming that people act according to their emotional motives and reflexes at the time of earthquake is reviewed, some approaches in psychology support the data obtained from the interviews. One of these approaches is "behaviorism" and according to this theorem, people only exist with the behaviors they exhibit against triggering factors. Besides, with the "conditioned reflex" proved by Burrhus Frederic Skinner's Pavlov's Dog experiments, it is seen that people may decide only with their reflexes without the wisdom and intelligence being active. People who jump out of a window, run towards stairs instead of going towards safe areas during the shock and who get hurt are considered as the proof of this theorem (cf. Yılmaz 2017, 22).

Besides, it was determined as a result of the interviews that in 1999 Marmara Earthquake many people who were caught by the earthquake unprepared lost their lives or got injured due to their reflexes. So, it is very important for individuals to become informed about earthquake and educate themselves in order to be prepared for a possible earthquake. The data gathered indicate that may problems occur in an earthquake arise due to lack of knowledge and the wrong decisions made without thinking as a result of reflexes. After these investigations, it is obvious that the society, particularly the children, should be educated on earthquake and the ways of protecting themselves from earthquake. It should be expected that people would become informed and experienced through the studies to be conducted on this matter. Thus, it may be possible to minimize the problems encountered in the previous earthquake.

According to the earthquake victims who lived through 1999 Marmara Earthquake, the need for assembly areas after the earthquake is not on top of the list of requirements. In this context, according to the data obtained, the only hypothesis that is not approved in the research has been "The biggest needs after the earthquake are the pre-determined assembly areas and being prepared for a possible earthquake". The participants mentioning the importance of assembly areas determined that the most needed things after e-

arthquake were clean drinking water, food, restroom, blanket to warm up and tent for shelter. According to the participants, fulfilling these needs are very important.

Today, as a result of the decreasing number of green areas and the new buildings constructed to assembly areas in earthquakes for income, it is seen that there left no place for the people to take refuge in after an earthquake. When a list of requirements is prepared, the participants approved that arranging an assembly area is a problem that should be addressed after the basic needs. Therefore, this hypothesis was not completely refuted but did not rank the first in the order of importance.

As a result, although earthquake is an unavoidable natural disaster, its damages may be mitigated through the measures taken. When the data are considered, it is necessary to give more importance to the trainings on earthquake. Better informing the children and their families about earthquake may help to resolve the problems which may occur during a possible earthquake. Besides, if a person has the information to protect him/herself, then he/she can protect him/herself and his/her family against the dangers and mitigate the possible damages. It is very important for an individual to educate him/herself about what to do before, during and after the earthquake.

Fulfilling the lack of information and giving importance to the education on earthquake issues revealed as a result of the research would help solving the future problems.

IV Product Development

13 Design Briefing

> *"we share our philosophy of design and the seven mindsets that set us apart: empathy, optimism, iteration, creative confidence, making, embracing ambiguity, and learning from failure." (IDEO 2015, 10)*

Before addressing how the design of this project was developed, it is necessary to mention that the research progresses with a human centered insight. The reason for preferring this design insight is because the exact causes of the problems occurred after the incident may only be described by those who experience that moment. Based on this, with the information obtained in the empiricism part through the interviewers and the empathy established with them, it had been possible to determine the exact cause of the problems occurred after the earthquake.

A detailed preliminary review about how this solution oriented project regarding the problem detected based on the results of theoretical and empiric researches conducted would be performed is explained in the following design briefing.
For people to overcome earthquake with minimum damage, they need to know how should they act in face of dangers and risks that may come up against at the moment of earthquake, how should they get organized and what would be their needs (cf. Kadıoğlu 2008, 19). Therefore, the purpose of the product prepared is to make people conscious about earthquake and raise awareness as much as possible. It is particularly intended to allow children learn the unknown or disregarded issues about before, during and after the earthquake while having fun with this product in their school, family and friend environments.

Due to the review method of the subject matter contained in the product designed, it is involved in didactic games category. The reason for preferring this category is that it is capable of putting all the values defined in the research process of the product forward and of facilitating the learning. As in general design models, the design of the product consists of analysis; design, test stage, application and business plan steps. The steps of this model and the sub-tasks of each step are given in the following table.

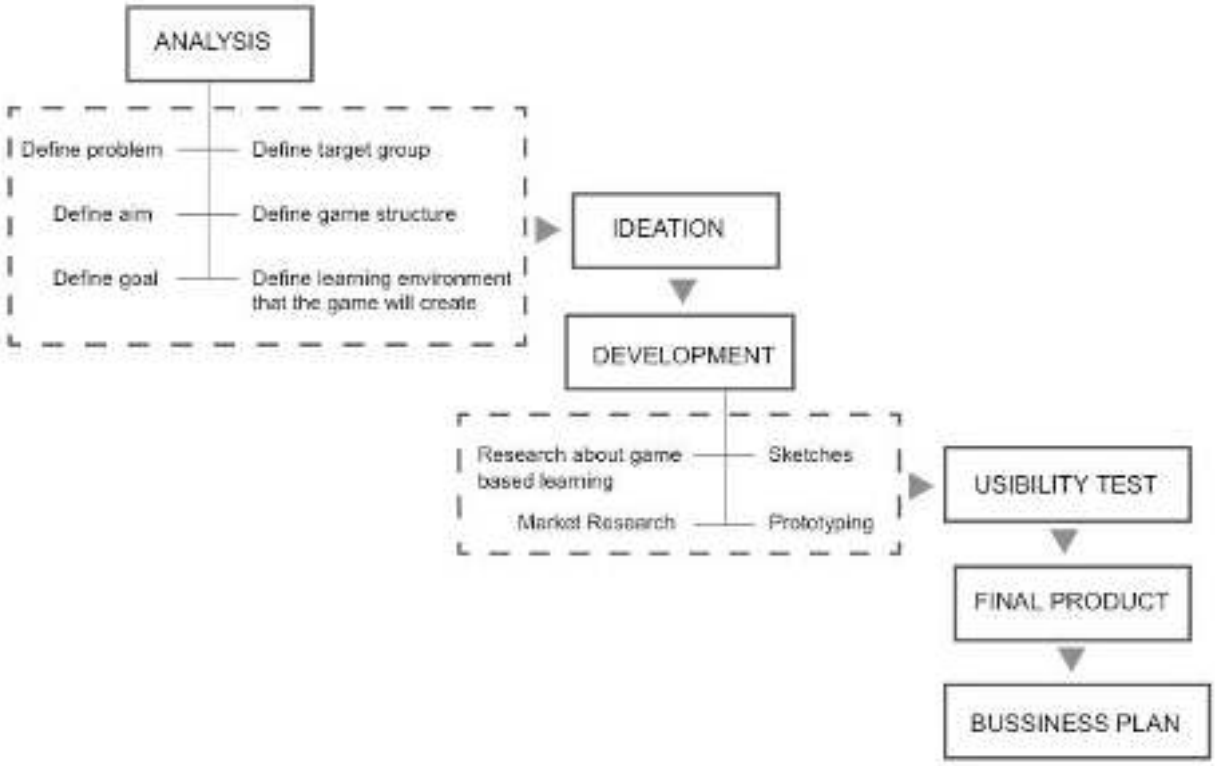

Table 12: Progress of the product development (own graphic)

As shown in the table, this process includes all the required steps to create a meaningful and a practical design. In this section, creating the suitable product to fulfill the objectives of the thesis, proper progress of the product development process and testing the product designed by preparing a prototype are addressed. After these studies conducted, the paths to be followed by creating a business plan over the final version of the product are shown.

A moodboard was prepared to decide how the properties defined throughout the research should be put forward by analyzing the effects of the sample product group on the users. Because of the moodboard given below, the subjects and the terms intended to be addressed during the product design process are explained rapidly and easily.

Figure 24: Moodboard for inspiration (own figure)

The lack of education which is determined as the most significant finding of empiricism should be fulfilled with this product and the product should facilitate the user's life through education with fun. With this product, the user should learn that earthquake is a natural disaster and it may not be avoided, and he/she should prepare himself/herself to an earthquake with the new information acquired. Therefore, this product should improve the daily life of the user by becoming a part of life. Besides, with the colors and the design preferred, the product should attract the attention of the user as a whole. So, the packaging design is as much important as the content of the game.

The users may bring the product anywhere with ease. Therefore, for the product to be portable and easily stored at home or school, very large sizes should not be preferred.

The product, which is planned to be use for more than once to have more information about earthquake, should satisfy the user in terms of durability. Therefore, it should be of quality and durable materials. Besides, for the product to gain a permanent place in the market, a good business plan should be created.

At last, it is obvious that the product made during the study process should leave positive effects on the lives of all shareholders. Therefore, the product should be widely capable of solving problems about the subject. This product, which was designed with a human

centered approach, should also bring innovations and facilities that touch the lives of its users.

14 Rough Ideation

The design process for solving the problem obtained after the theory and empiric studies conducted started with studies to produce solution recommendations. All of these recommendations are thought to minimize the accidents and mistakes after the e-arthquake. Based on this, "what kind of products may be designed to educate the children and their families living in places with insufficient knowledge about earthquake in an easy and fun manner?" question was determined and then, several brainstorming sessions were held individually and in groups. During the project process, which started with an education focused approach, different ideas came forward. In the answers collected, it is seen in general that it would be helpful to educate children with fun. Because it is thought that the learning may be rendered more permanent when the children are eager to learn. Therefore, during the brainstorming sessions the ideas that bring fun and education words together were discussed.

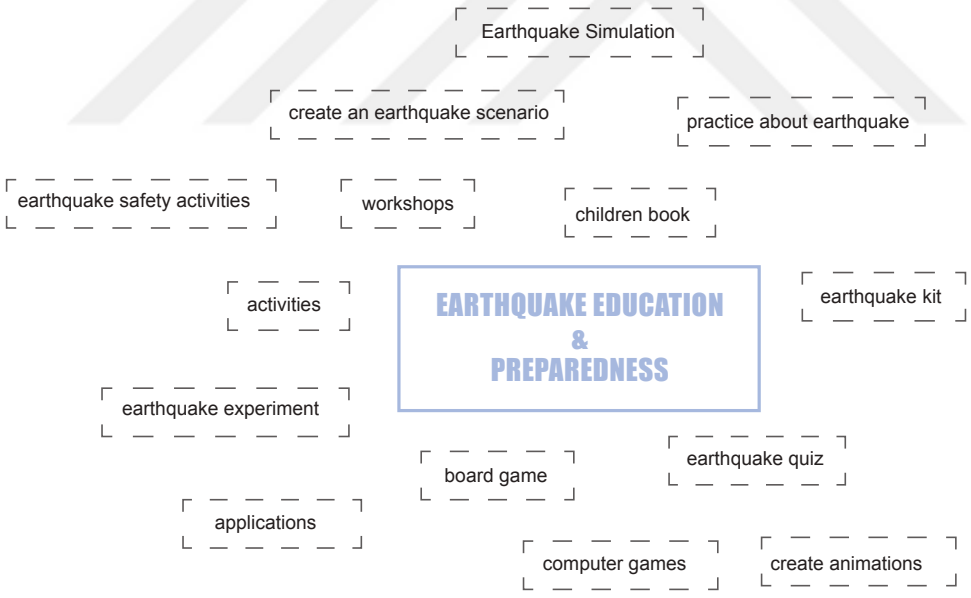

Figure 25: Outcome brainstrom sessions (own figure)

In the graphic above, the keywords determined after brainstorm sessions are given. Some of these words were analyzed individually and some in groups, and solution recommendations made on them. The advantages and disadvantages of these recommendations were analyzed and it was decided by getting the opinion of the target audience. The approach, which was the most suitable for the research subject and the target audience, was determined and we focused on that topic during the design process.

Figure 26: Some sketches for the rough ideation (own graphic)

Some of the solution recommendations determined are given in the table above and while some of them were prepared in sketches for the analysis studies, the others were prepared in writing. Thus, it had been easier to make analysis between the subjects. Some of the solution recommendations are as follows:

Simulation means modeling with the help of computer and it is also called as simulation model. It enables experiencing the simulated, i.e. modeled environment and incidents as if in real life (cf. Yılmaz 2017, 173). Based on this information, possibility to conduct a simulation study on earthquake is among the ideas offered. For example, the moment of earthquake may be fictionalized with a simulation and the players may be taught what to do by having them experience that moment. So, it may possible for the players, who experience the moment of earthquake, to understand what is right and what is wrong with the decisions made by them. But building a setup where the children who has not experienced earthquake before lived through that moment without getting scared makes the matter a little complicated and exceeds the time determined for the project. Besides, based on the researches conducted, the simulation of wrong behaviors is not approved because it is possible that the actions may affect the subconscious and may have unfavorable effects on behavioral change (cf. Yılmaz 2017, 174). For this reason, it is seen as a rather usual outcome for children to be affected unfavorable and close themselves to the matter instead of fun learning.

When the effect of interaction of the children with each other on learning is considered, an idea suggested that students might learn during breaks or in lessons with fun by building a question driven puzzle wall and a puzzle board in the school garden. For example, each puzzle piece may contain a question or a topic about earthquake and the students have to answer these questions together to gather the puzzle pieces. So, an interactive learning between the children may be provided. The most important disadvantage in this suggestion is that the product may not be accepted by every school due to the are it will cover.

Another design idea was to issue a book on earthquake for the children predominantly composed of cartoons. The book may contain activities like questions, painting, cut-and-stick, and puzzle regarding earthquake. Thus, children may learn what to do about e-arthquake with the words and objects. However, the only disadvantage in this recommendation is that child would do this individually. It may be difficult to use this idea actively in a group.

When it came to game, which it was the most emphasized keyword among others, a couple of ideas were discussed again. The first one of them is creating a strategy game on earthquake. For example, it is designing a game where each player is given predetermined roles and asked to undertake certain tasks after earthquake, and the one who fulfills the task in the best way wins the game; thus they get informed through the strategic decisions they make. After studying and researching on this idea, it was understood that children are not very successful in strategic games and that the completion of the game requires quite a long time. Therefore, instead of a strategic game, we proceeded towards a direction where children may learn voluntarily without being pushed so much.

Finally, the idea of educating children by creating a question game with the questions prepared using the using the information obtained from the research conducted came up. It was considered possible to make children learn by making the quiz format enjoyable. It was revealed at the end of the analysis that this recommendation was the most realistic and most helpful idea among other ideas came up.

These solution recommendations should meet the basic qualifications determined as a result of the research. Therefore, the most suitable one in terms of time, budget and subject was selected. After the researches, interviews and brainstorming session, it was decided that game based learning method would be the best decision which may be implemented for this project to enable a meaningful learning by rendering boring subjects that children did not want fun and by teaching the concepts and what to do. In the following section, the resources and the market research regarding this method is addressed.

15 Game Based Learning

Games hold an important place in a child's world and today, it is possible to say that parents spent time with their children by playing games both to have fun and to learn some things together. Games accustom children to solve problems by investigating and discussing about the matter during the playing process.

Game based learning is developed based on learning by playing games (cf. Pektaş 2017, 480). In this method, the child relaxes and becomes motivated by showing interest in the content, understanding that learning is not difficult, creating self-confidence and wishing that the activity continues. Therefore, the use of games as an educational tool attracts interest of many researchers (cf. Aslan, Atıcı 2015, 78).

As a result of the researches in education field, it was proved that learning through games would be long lasting and more effective (cf. Pektaş 2017, 480). In his researches, Marc Prensky mentioned how games affected people and the benefits of using games in children's education. According to the statements of Prensky (2011) on games:

- Games are fun and therefore make the player happy.
- Fascinating games ensures the player is attached to the game and the subject with passion.
- Games are interactive and this ensures that the player remains active.
- Games have a motivating purpose.
- The problems to be solved and the questions to be answered in the games develop the creativity of the players and increase their wish to learn more about the matter.
- The interaction between the players in the games ensures that social groups are created during the game.
- With the stories presented by the games, the players experience the feelings in the story as a part of it. (cf. Prensky 2001, 106).

Besides, the competition in the games ensures that children gain knowledge and skills, and helps in increasing their interest in the matter and their wish to learn more in order to win the game (cf. Gredler 2003).

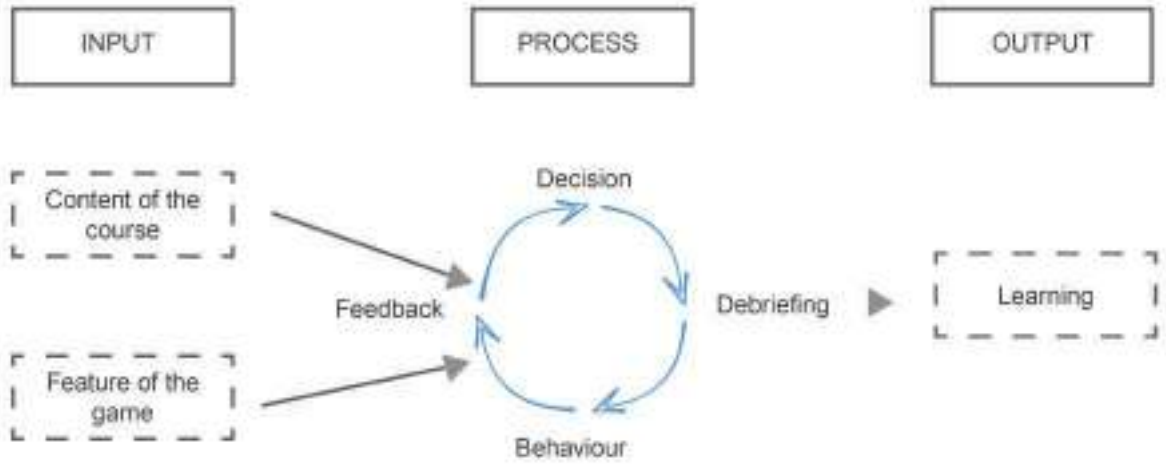

Figure 27: Game based learning model by Garris (2002) (own graphic)

In Figure 27, the relation between the game experience of the students with game based learning model of Garris (2002) and the learning results are given. With this table, it is aimed to tell that the lesson or the content of the subject intended to be taught is combined with the features of the game and included in the game process, and as a result, the subject intended to be taught is learned. (cf. Garris, Ahlers, Driskell 2002)

While game based learning environments provide the opportunity to have a great time during the game, they also have a didactic and intensifying characteristic thanks to the activity performed in the game. For this reason, the use of educational games in education assists in changing the conventional classroom environments, making the educational process more fun and attractive (cf. Aslan, Atıcı 2015, 82).

Accordingly, when it is considered that Turkey is on a seismic belt, game based learning method may be used to have children and parents educate themselves about earthquake. Thus, it may be ensured that individuals, who are even frightened of the word itself, understand that the earthquake may be overcome with less damage through the preparations and learn this in a fun way without getting bored. For the children and the adults, taking a concrete step in face of a disaster and being prepared may mitigate anxiety and may help the child to feel safe. In schools, teachers may increase the students' interest in the matter and teach the lesson easier by using the game based learning method. Besides, thanks to the information obtained through these games, parents may also think that their children away from them during a possible disaster are in safe even if just a bit.

In designing a game with a didactic purpose and content; *"the exercises should feature fun learning, problem solving, critical thinking, concept learning, maturing, being target oriented, being non-distracting, suitability with individual and group works, sufficiency in design, compliance with content, use according to the student's level." (Pektaş 2017, 480)*

According to Prensky, for a game to be attractive to children, the difficulty level should not be high. The simpler the games are, the more possible those children enjoy these games and want to play over and over again. Therefore, the difficulty of the game designed should be at a level that would not overwhelm the children (cf. Prensky 2006).

In the following part after the theoretical research on game based learning conducted before the design, the review of educational games in the market is addressed.

16 Market Analysis

In this section of the study a market research was conducted about the existing products and it was determined there are many board games in the market serving for different purposes like fun, strategy and education. In some lessons in the world and in Turkey, various games, which may be included in board games or tabletop games categories, may be used. Children may play these bard games with their teachers and classmates in the school and with their families at home. For example, "Sosbu - Social Sciences Specialist" game is a game prepared according to the content of the secondary school social sciences lessons in Turkey; its purpose is to teach the students the terms in a fun and didactic manner. The sales price in the market is 21€.

Figure 28: Sosbu and Ceo games (own graphic)

"CEO-Geography and Economy Game" given in Figure 28 inoculate the children with entrepreneurship conscious and enable them to learn the cities where and the size which the

sectors like agriculture, tourism and industry available, and make an inference about Turkish economy. The sales price of this game in the market is 20€. These games help students to learn with fun while studying these subjects at home or in school.

Figure 29: Educational board game examples (own figure)

Some of the games shown in Figure 29 are designed to enhance the vocabulary knowledge of the children and some intend to educate the child by addressing the wars and historical events. When the games were reviewed, the preferred level of difficulty was determined in a manner easily understandable by the children. The purpose here is to facilitate learning by enabling children to understand easily instead of pushing them. So, difficult strategic games

As a result of this research, it is seen that the board games have a significant place in the market and they are used as educational support. The average sales prices of the board games in Turkey change between 10€ and 60€. In Figure 30, the comparison of the prices of board games used for educational purposes in the market is given.

Figure 30: Comparison of board game prices (own graphic)

17 Development

After collecting all data required for designing the game and conducting the necessary market research, the design stage was initiated by defining the purpose and the target of the game. Besides, the basic needs that should be emphasized for the product were determined and several trial version of the product were made. With these prototypes, the rules of the game and how would it be shaped visually were considered.

"What kind of a relation may be established between game based learning method and earthquake education?" question was asked to assist in designing the game and this question was attempted to be answered through both individual and group brainstorming sessions. This stage was repeated until an answer to the question asked to reach a solution was found. The following graphic shows the keywords came up during brainstorming sessions.

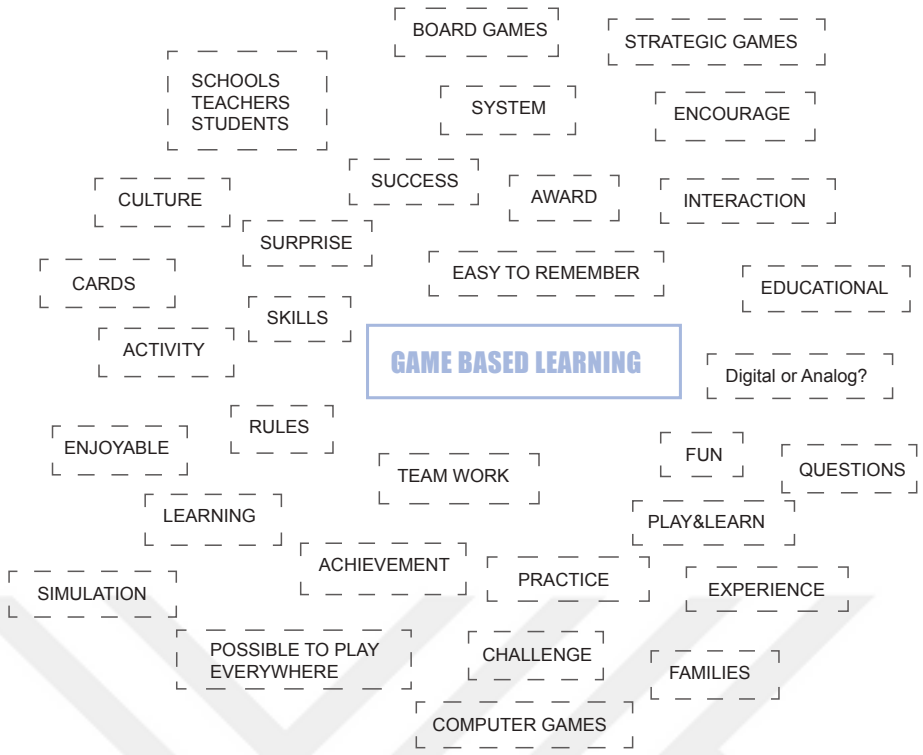

Figure 31: Outcome brainstrom sessions (own graphic)

With the keywords given in the table above, the components required for the game and the concepts intended to be obtained came forward. Among the keywords that stood forward are terms like group work, experience, fun, practice, interaction, success, surprise, possible to play everywhere, encourage, play&learn. Some preliminary studies were conducted to convert these data into design.

In the product design it is intended to create a didactic game from a concept like earthquake, which bothers the society; to provide experience to players through this game; and to motivate and teach the individuals as a result of the experience gained. In Figure 32, the inputs and the objectives of the game are shown.

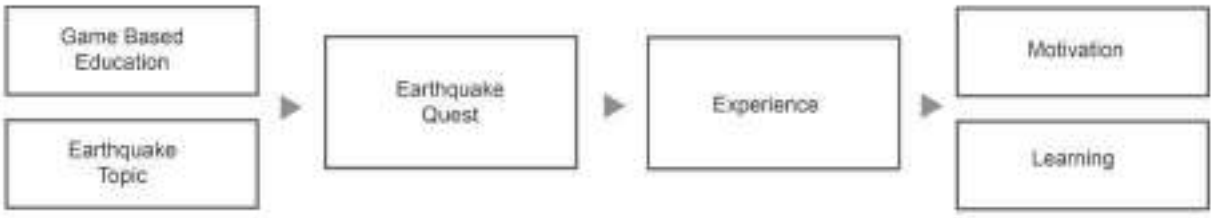

Figure 32: The Inputs and the objectives of the game (own graphic)

It should be possible to play the game anywhere. By this way, the users may play the game in the school garden, in parks, in classes and during friend meetings. The players may undertake certain responsibilities by making common decisions through interaction and group work, and learn some things from each other. Besides, thanks to the interaction between the players fictionalized within the game a player may be responsible for the learning of another player. Finally, bringing game and learning together refers making boring subjects enjoyable; thus, the willingness to learn of the person playing the game may increase and get informed about the subject by being attached to the game involuntarily. By accentuating these ideas to create a didactic game, some researches were made on sample games.

Figure 33: Game moodboard for inspiration (own figure)

Bright colored game boxes and figures had been the inspiration throughout the design process. To attract the attention of the children and to help them create a fun, active, happy mood, bright colored objects and games were considered.

It was detected through the sample games reviewed that designing a bright and an attractive product would increase the functionality and motivation, and that these colors played an important role in minimizing the boringness of the subject intended to be ex-

plained. It is inevitable for a product, which does not cause a confusion but designed in an attractive manner to draw interest of the children.

Following the reviews conducted on the rules, colors and form of the game, it was decided that characters that match the story told should be created to guide the children in the game. With these characters, it is possible that children are more attached to the game and want to look like the heroes of that story. Therefore, the rescue teams take office during earthquakes has been the inspiration for the characters that should be created for the game. It may be considered to address these teams saving lives in the game as superheroes with super powers in the eyes of the children. The following moodboard was prepared for the characters of the game.

Figure 34: Moodboard for further character creations (own figure)

As it is seen in Figure 34, the orange color, which is used on the clothes of rescue teams, was very effective on the creating of the characters. Besides, the dogs, which help the disaster recovery teams in many natural disasters like earthquake, had also been an inspiration. Dogs may lend color to the game with their cute and strong characters and may easily draw the attention of children. Thus, these examples were considered while creating the characters in the game.

The design works started after preparing the mood board for the inspiring resources and reviewing the didactic game samples in the market, and many sketches were drawn until the design was finalized. With these sketches, trials were made in many areas like how

should the game proceed, creating the questions, creating characters, and the design of the cards and the logo. The sketches and the prototype samples are shown in the following tables.

Figure 35: First logo ideas (own figure)

Figure 36: First sketches for the characters (own figure)

Figure 37: Prototype (own figure)

18 Usibility Test

The test study of the game, which was designed according to game based learning method, is performed with the illustrated version prototype of the game.

The school constituting the study group where the test stage of the game is performed is the Private Taş Collage in Bakırköy, Istanbul. The study, which was conducted during the spring semester of 2018 school year, was performed with the 5th grade students and their class teachers upon obtaining permission of the school authorities. There are 20 students at the age of ten years. The most important aspect of this study is that the group testing the game is independent from the researcher. Thus, the test group played the game impartially and reported their comments on this game.

The test application that lasted for one course period, which is 45 minutes, indicates that the game may be completed within the targeted time. Pınar Karakuş, the class teacher, who take on the task of moderator in the game reviewed the rules handbook and started the game by reading them to the class. Pınar Karakuş completed the game process without any support and mentioned that the game was simple and progressed with a clear

language. Besides, she wanted to have the other 5th grade classes play the game and stated that the game is practical and fit the purpose.

Figure 38: Students playing Be The Next Hero (own figure)

Figure 39: Students playing Be The Next Hero (own figure)

The game was played with 5 groups of 4 in a class of 20 students. One of the purposes of the game designed is to develop the social sides of the students while playing the game. Therefore, as a result of the observations during the game, it was detected that students in the groups establish communication with each other in a proper and fun manner.

At the end of the game, the students who answered the questions expressed they realized that they didn't know much about earthquake. Some students argued that the topics taught after the classes or exams were generally forgotten because they were not repeated. Besides, the students tested the game had difficulty in questions in English. The students said that the questions were written in a clear language and that the game might also be used in English classes.

The idea that the winning group at the end of the game would be the hero of the city triggered the competition and the determination to win and thus, the students made great effort to answer the questions correctly. While one group is answering the questions the other groups listened the questions carefully and actively played the game.

At the end of the game, all students were given game certificate. This certificate given to the students at the end of the game made them happy and increased their self-confidence by acquiring knowledge about earthquake. Thus, it was understood that the game, which intends to motivate students while playing, progressed in alignment.

As a result of the observations she made throughout the game, Pınar Karakuş stated she detected that the game help shy and reserved students express their feelings and thoughts more easily and she thinks that using this game while teaching earthquake would ensure students participate that class more willingly.

At the end of the game, the students were shown the alternatives prepared for the package design. As it is intended to attract the attention of children with this game, getting their opinion is very important. Upon reviewing the packing samples, the packing was finalized by the design preferred by the students.

Figure 40: Students with Be The Next Hero (own figure)

The features of the game, which the students liked, the most were determined as the story at the beginning of the story, completely being knowledge oriented and the certificates they received at the end. In general, the test stage accomplished with positive comment shows that the students may want to learn even the boring subjects by games. The test result indicates that the game is practical and the teachers may use it as a supportive tool in the classes. This study also proves the accuracy of the hypothesis determined as a result of all researches conducted. It was understood once again that the reasons people afraid of earthquake were their ignorance about the matter and being unprepared for an earthquake.

19 Final Product

Figure 41: Be The Next Hero (own figure)

A good game is a game in which the player learns everything worth discovering in the game before getting bored, and in which he/she becomes skilled (cf. Pektaş 2017, 483) Therefore, while designing a successful game, it is very important to determine the purpose and the target of the game. In addition to them, the visual content needs to be designed and presented to the target audience in a well-thought manner. Besides, it is important for the integrity of the game to design a striking scenario, determine the awards, to adapt the preferred typography and the colors to the entirety of the design (cf. Pektaş 2017, 484) In this part, the factors and the design items that affect the design of the game.

19.1 Aim of the Game

In a game with a purpose, reaching the target considerably increases the motivation (cf. Korkusuz, Karamete 2013, 84). The aim in designing this game is to make as much people as possible aware of earthquake. With this game, the children and their parents are intended to self-educate them on the unknown or disregarded matters before, during and after the earthquake.

By this way, it will be possible to achieve mitigation and preparedness behaviors regarding the earthquake.With the rules design and the story built in the game, it was ensured that the aim of the game was noticed by the players.

19.2 Goal of the Game

The goal of the game is to answer the questions correctly and to complete the game within the given time.

Although reaching the goal sometimes forces the players, it is important for putting a pressure on the player to reveal his/her capacity and to push him/her to win (cf. Korkusuz, Karamete 2013, 84).

19.3 Target Group

Before determining the story and the rules of the game, it is necessary to determine who will play the game. In this game, the school-age children were selected as target group. As it is considered that the earthquake education should start at a young age, a game which may be played by anyone older than 9 years was designed.The reason for preferring to start with 9 years age group is because the problem solving ability is more successful at this age and older compared to younger ages. Besides, this preference had been a more realistic approach for the group determined as the target audience of the game to understand and learn the concepts about earthquake more easily.

19.4 Development Process and the Rules of the Game

> *"You have to learn the rules of the game. And then you have to play better than anyone else." (Albert Einstein)*

During the development period of the game, first studies were conducted over the drafts and then the game was finalized. In this part, understanding the targets of the game, how to proceed in the game and how the players playing the game will be awarded in case they win the game aspects were designed.

In the study, the lack of education in the society about earthquake is addressed and it is intended to have children and parents consolidate the knowledge learned and to get new information. The game was prepared to be admired and played by a wide audience and therefore it was designed at a level neither very simple nor very difficult. All the rules are given in the rules manual in detail for the game to be comprehensible.
Before the design stage of this game played on a board with certain rules, the researcher examined many board games and determined the points to be considered. Thus, it was

possible to prepare the materials of the game intended to be designed and to shape the rules.

The game was enriched with rules and materials. The questions, study texts, graphics, board showing the route of the game and the question cards used in the game were finalized after the researches conducted and drawings.

The concepts before, during and after an earthquake explained in disaster management and earthquake preparedness chapters in the theory part were considered as the starting point of design. Based on this starting point, the question cards consisting of three categories in the game and the game board moving in line with these questions were designed. These categories were built in different colors as "Learn about earthquakes", "Before the Earthquake" and "During and After an Earthquake", respectively. There are 86 question cards in the game and these questions cards were prepared according to the content of the categories they belong to. The board and the other materials used in the game were finalized after many studies and trials.

The game may be played by at least three and at most five people or between groups. The groups in the game may be arranged upon the players' wish. However, if the game would be played at school, it would better that the teacher in the classroom determines the groups. This is because the teachers know the students they educate better in terms of behavior and character. Thus, the balance between the groups may be established properly. Besides, different groups many be created every time the game is played and the motivation and thrill of the game may be preserved by preventing the same people win the game at all times.

While preparing the questions, the references reviewed in the theory part were used. The questions are arranged in three types, which are multiple choice, two choices and with action, to measure the knowledge of the player on earthquake. The difficulty of the questions are at a level which may be answered by anyone literate, and the misleading answers used in the answer choices determine the difficulty level of the questions. While preparing the questions, it was intended that the player would be able to answer the questions easily and thus learn the subject smoothly rather than forcing them.

The average time of the game was calculated as 45 minutes. At the beginning of the game, the class teacher or someone from the group playing the game is chosen as a moderator; this person is responsible for rules and the control of the answers throughout the game. The order in the game is set based on the dice thrown and the dice is not used anymore in the game. The players in the game continue the game by advancing one step based on the question cards they answered correctly rather than throwing a dice.

The player started the game picks the card in the category where he/she stands on the board and he/she should read the question loud and give the answer. The maximum time for each question is 1 minute; if the question is not answered within 1 minute, the player

is considered not knowing the answer. The question cards used during the game are placed under the deck after being answered. It is possible that players come across each question more than once. Thus, the players have to follow the question on the question cards of other groups and the answers given although it is not their turn. The purpose here is to keep the player active in the game without distraction. By this way, it is possible to increase the eagerness to learn.

During the game, the player who answers the question correctly during the game advances on step and the players who cannot answer the questions wait in their current step for the next tour. Besides, if the player does not understand the question in the question card, he/she may pass the card to another player. If the new player who takes the question card fails to answer, then the card is placed under the deck and no one can proceed on the board. The purpose here is that during the game everyone focuses on the questions.

The players who answer the starred questions among the question cards, collect these cards and they may proceed two steps in the next tour without answering questions. Besides, they may skip the "wait one turn" commands with these cards collected. For this, the players need to collect 3 starred cards and by this means, it is targeted that they are attached to the game and play more willingly.

With the "show drop-cover-hold on" command in the question card, during the game the player answers the questions not only verbally but also by using his/her body language. Thereby, the player learns what to do during earthquake at the game.

With the "choose another player and ask the question" commands on the game board, the interaction between the players are increased and the players are held responsible for the learning of each other. With this command, if the player asking the question gets a correct answer for his/her question, the player who answers the questions precedes two steps. Besides, the commands like "answer right and go ahead 2 spots, answer wrong and go back 1" and "…wait one turn" on the game board intend to avoid players getting bored and to make them more ambitious.

The players should complete the game without getting help from each other. This is to ensure they take learning serious without cheating individually or as a group. If the game is played as a group, the answer to the question should be discussed within the group.

In the game, apart from the game board and question cards, there are the game box, pawns, hourglass and dice. The packing of the game was designed to attract the attention of the players and the other materials were tried to be chosen from the materials suitable to the target.

Being designed as a board game involves the game into the portable games category and thus, the players may play the game anywhere they want. No scoring systems were fic-

tionalized in the game, so the game ends when the players complete the path on the game board. The winner is awarded with the certificate prepared as prize. Thus, a target is offered to the players while they play. This is important for the motivation of the players.

At the end of this game designed, it is expected that the players acquaint with earthquake and learn that earthquake is a natural disaster and they may not prevent it. Players gain experience as they play the game for more than once and become experts of the subject. The design of the game board and other materials are reviewed in more detail in following sections.

19.5 Be The Next Hero

19.5.1 Brand Name/Logo

In this section the brand identity of the game is addressed and the logo design, colors used in the game, typography preferences and application forms are discussed.

At the stage when the brand name of the product is created, the competition in the market among the games is considered and it is intended that the game designed comes to the forefront and that the name of the game leaves a favorable impression on the target audience. As a result of the researches conducted, the name to be given to the game was chosen among the colorful and fun terms to make it attractive and it is designed in compliance with the purpose of the game. For the game to arouse curiosity in children, no terms close to earthquake terms were selected. Besides, for the logo designed to be catching, it was decided to use the logo as the brand name. So, it is targeted to develop different versions of this game in the future under Be The Next Hero brand.

A person wise, helpful and brave in the face of danger is called "Hero" and this term was preferred to motivate and encourage the children intended to be educated on earthquake. Thinking of becoming a hero in case they win at the end of the game makes the game more attractive for the players who are expected to answer the questions correctly during the game. The following figure shows the developed from of the logo.

Figure 42: Be The Next Hero logo (own figure)

Three colors are used in the logo design. These colors are the dominant colors in the game. The intent in preferring vivid and bright colors is that such colors attract attention of the children and open up their senses. Blue, yellow and orange were preferred as the main colors of the design. These colors are integrated with the design in a manner that does not strain the eyes. These colors were chosen to guide the players in a psychologically positive manner throughout the game.

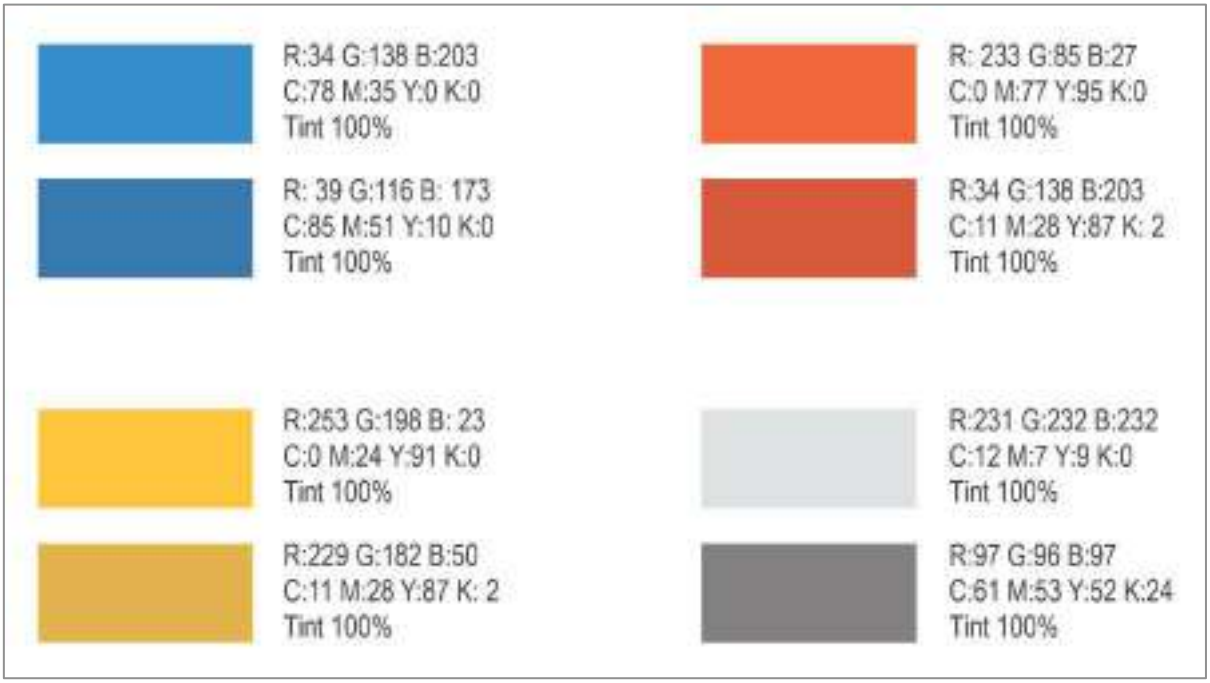

Figure 43: Choosen colors (own figure)

The game consists of three categories and these categories are named as "learn about earthquakes", "before the earthquake" and "during and after the earthquake". Each category is represented with a color. These colors were chosen to guide the players in a psychologically positive manner throughout the game. The meanings of the colors in the game are as follows:

Blue: Represents strength, wisdom and truth concepts. This color is used in the part prepared to allow the players learn the basic information about earthquake. It is a color that has positive effects on human mind and body and a very dynamic color overall.

Yellow: This color shows a state of warning and preparation. It tells to the players to slow down and be in full alert. That is exactly people need to be to get ready before an earthquake hits.

Orange: This is the color that most rescue teams use on their clothes to stand out and be easy to spot among the remains of buildings, houses and other damaged sites after an earthquake. Orange symbolizes life, encouragement; balance, freeform, stimulation, health, among many other things. It is the complementary color to blue, which makes it a full circle with the three main colors of the game.

The color transitions preferred in the design are the one hue darker of the main colors and gray. The purpose here is the intent to convey the design to the target audience in the most accurate manner and to establish a harmony among the colors. The light gray color used on the background of the game package, board and rules guide was preferred to bring the design items to the forefront. These colors preferred in design serve the purpose of the game.

In compliance with the purpose of the game, logo was designed in a manner legible and perceivable by anyone at the age of 9 years or older. To prevent any complicated look on this logo designed, no special effects like shadows, reflections were used and bold and clean lines were used.

Figure 44: Choosen font for the logo (own figure)

The font preferred in the logo design was modified and individuated. The font used in the game was selected among the fonts that would express the functionality of the game in the most proper manner. This selection was made carefully to allow the player to read

the game box, game board, game cards and the rules guide easily. While determining the fonts of Be The Next Hero game of which the target audience is children, the explanations, rules and commands are created in a short and apparent manner. So, while playing the game it is prevented that the children gets bored of long texts before even starting to play and their interest in the game will increase. Below, the fonts used in design are shown.

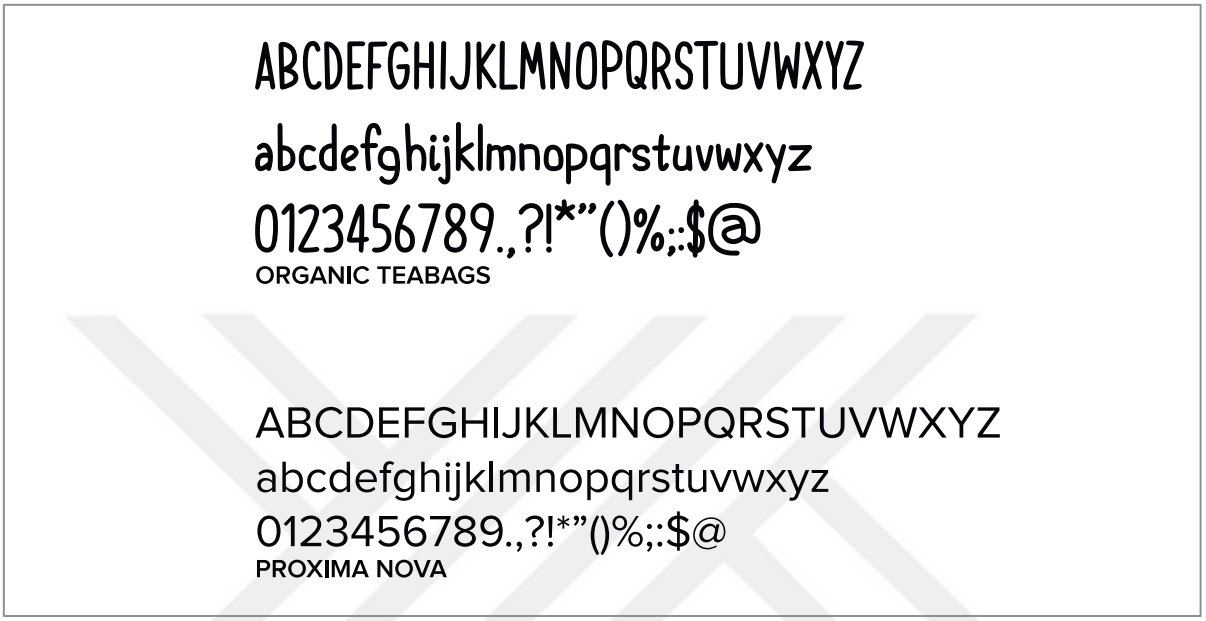

Figure 45: Choosen font for the game (own figure)

19.5.2 Characters and Storytelling

Games always tell a story (cf. Pektaş 2917, 484), A strong and striking story helps the players adopt the game they play and reach the target of the game (cf. Korkusuz, Karamete 2013, 85). Therefore, a fun and a colorful story was built to allow the children and their parents learn the earthquake subject without getting bored. For this story to attract the children, two characters were created to support the story built. These two characters who represent the heroes of the city were finalized after the sketch drawings. These characters designed are the officials in the game specialized in earthquake. At the design stage, the characters were inspired from disaster recovery teams as mentioned in the "18. Development" section. The illustration in Figure 45 shows the final versions of the characters.

Figure 46: Final illustrations of the characters (own figure)

To design the different versions of the game in the future and to ensure its continuity, the characters were given international names. These characters named Tom and Milo were selected among the other alternative names, which may arouse interest of the children.

The story begins with Tom and Milo searching for new heroes for themselves all over the world. The story of the game continues as follows:

"Tom and Milo, who think it is impossible to prepare the whole world for earthquake with a team of two, decide to build a team. However, they are aware that this is not an easy process and that they cannot trust everyone. Therefore, they determined the cities under earthquake risk and send these cities the box of questions about earthquake experience that they prepared. As the boxes are distributed, they know that a little time left to determine the new heroes, so they wait for the results with patience. People, who answer the questions correctly and finish the game, accomplish the process by receiving their bravery certificates. By this means, they will become informed about earthquake and they may take their families and the cities they live in under protection by learning what to do before, during and after the earthquake. Besides, their first mission after becoming a hero is to share the information they received and to educate everyone about e-arthquake. ”

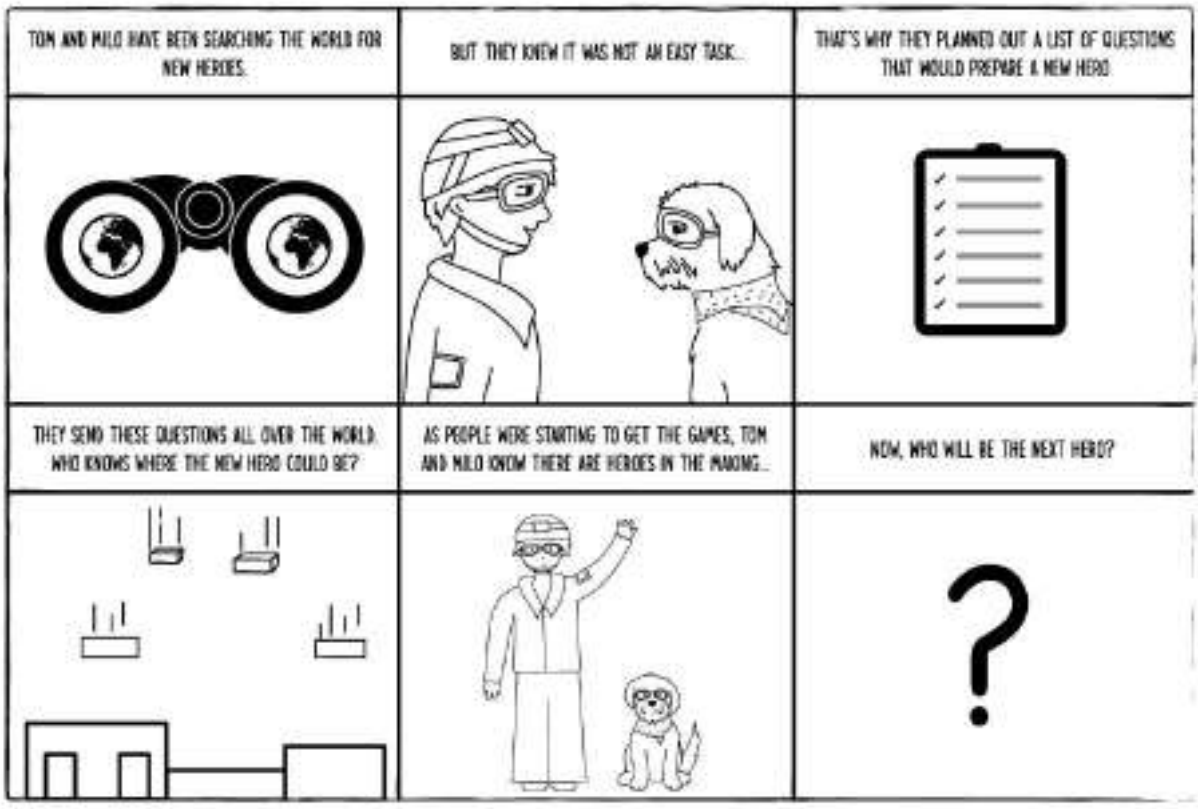

Figure 47: Storyboard of the game (own figure)

With this story, the players in the game are enabled to understand their objectives and targets in the game easily. This story was also considered to involve the imagination of the player into the game. Therefore, categories and rules supporting the story in the game were prepared. The story and the characters were detailed by considering the target audience and thus the game became more effective by preventing distraction.

19.5.3 Rule Book

The game guideline indicating how the game is played and the rules of it was prepared to allow players to finish the game without any problems. This guideline prepared by paying attention to details was arranged in a plain format to allow the players follow the rules without getting confused.

The game guideline was written in a fluent language, which does not bore the target audience. It was observed to keep the text and graphics used in the design of the guideline in integrity. The size of the guideline when closed is A5, and A4 when open. The reason for selecting these sizes is for the ease of use during the game. On the cover Be The Next Hero logo, which is the name of the game and the brand, is used. On the back cover the story board describing the game and the contact information are given.

The fonts and the colors of the graphics used in the background are arranged in harmony and in a manner not straining the eyes. Because the game guideline is folded, the paper thickness was considered. Below the inner pages, front and back covers of the guideline are shown.

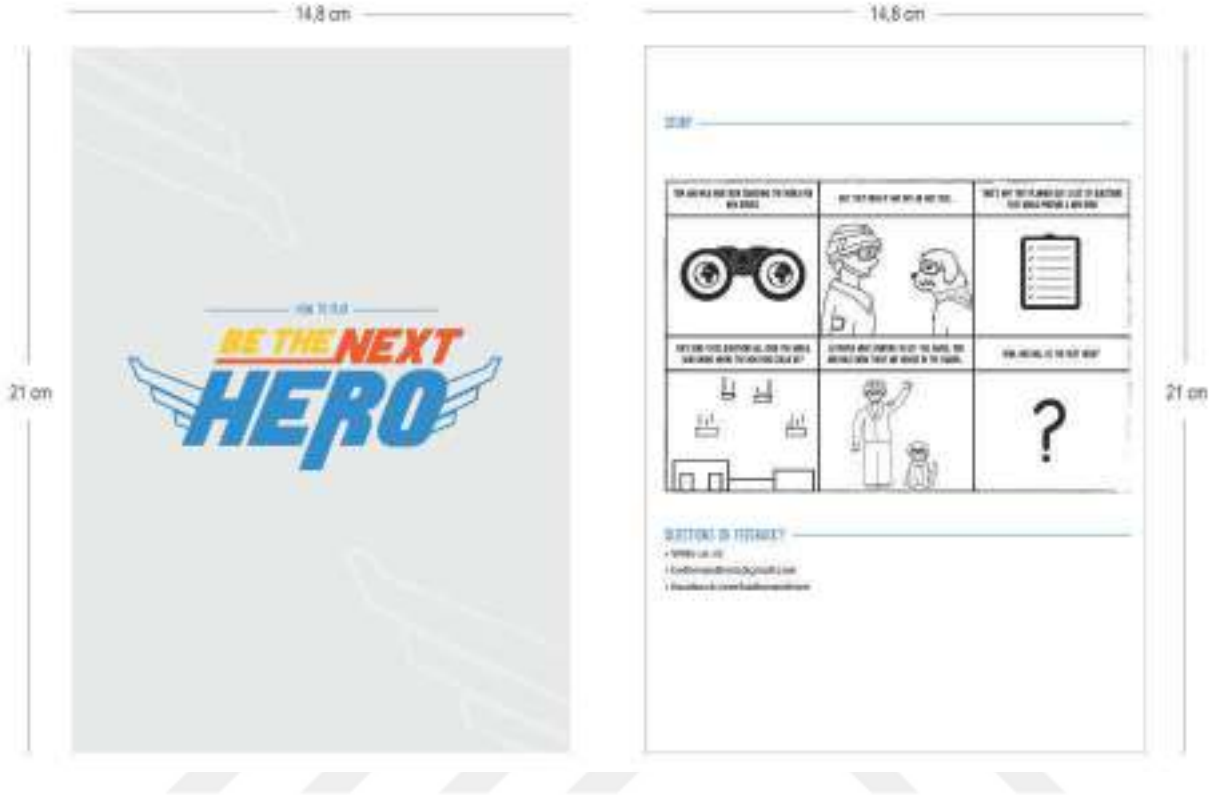

Figure 48: Front and back pages of the rule book with measurements (own figure)

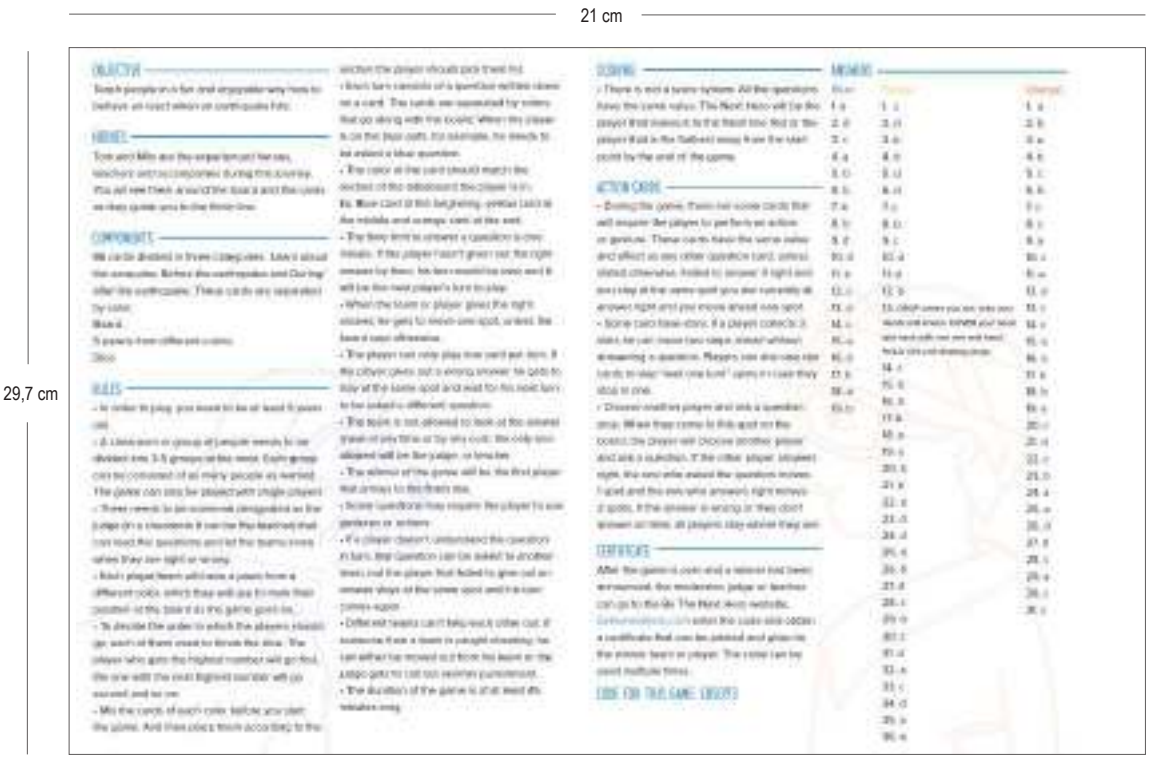

Figure 49: Inside pages of the rulebook with measurements (own figure)

19.5.4 Board

The game is played on a road map prepared from cardboard. In its design, blue, yellow and orange colors are used as it is throughout the game. Each color represents a category and the colors used on the board are the same color with the question cards of the categories. Thus, the players may easily understand that he/she should answer the questions of the category on which it stands at his/her turn. The game board is designed to fold into four so that it does not hold too much space in the game box. Based on this, the size of the game board prepared is shown below.

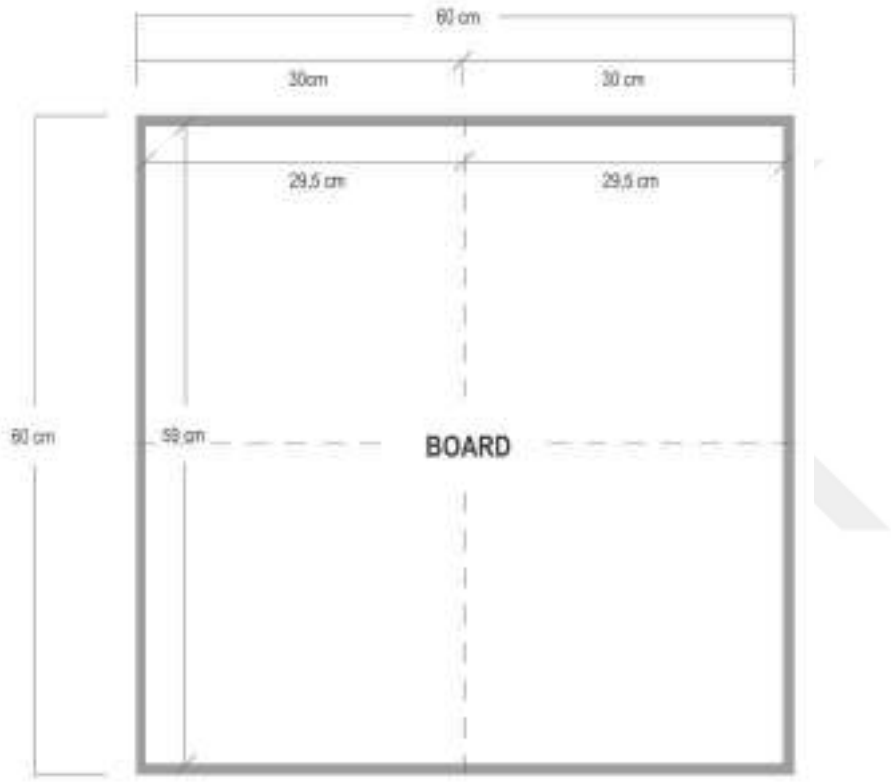

Figure 50: Measurements of the board (own figure)

While designing the game board, a path on which the players may proceed without getting bored was designed. Players, who may proceed in case they answer the questions correctly, may easily understand from the design of the game board that the target of the game is to reach the finish within the given period. The blue color preferred in the design represents the category where the basic questions on earthquake are answered under "learn about earthquakes" title; the yellow color represents how the player should prepare himself/herself, his/her home and the people around him/her for the earthquake under "before the earthquake" title; and the orange color represents the part where they learn what is important to do during and after the earthquake.

Figure 51: Final illustration of the board (own figure)

On the path to finish the game, there are some commands to make the players ambitious during the game and to make the game more interesting to them. These commands are built in three different styles. Detailed information on this matter is explained in "20.4 Game Development Process and the Rules" section. The locations of these commands on the board are shown below.

The icons on the board are designed separately in compliance with the purpose of the matter. Each icon is used in the color of the category it represents based on the content of the game. While the game board becomes interesting for the children with the use of these icons, the careful selection and the concise use of the icons on the board prevents any confusions during the game.

Figure 52: Icons (own figure)

The illustration on the game board was covered with matt lamination after being printed on glossy photo paper. The reason for preferring this coating is to make the game board long lasting, avoid finger marks and the sticking of the pawns and cards placed on it while playing, and to allow a smooth play. Then, the game board was finalized by pressing it on a 1.3 mm cardboard covered with book cloth.

The pawns, which help to show location of the players on the game board, were preferred in straight geometric forms to avoid confusion. There is also an earthquake information booklet prepared for children, parents and families. Thus, people who would like to get information about the matter after the game may acquaint with the matter.

Figure 53: The board and the pawns (own figure)

19.5.5 Game Cards

The question cards were created as a result of the researches conducted in theory and empiricism sections and the findings obtained. The questions used in the game were prepared carefully by reviewing the relevant resources. Because the target audience of the game is children, no statements, which may cause a problem in a child's psychology, are used. These questions were finalized upon the review of pedagogy experts. The question cards were designed in compliance with the categories on the game board. Therefore, the question card of each category was arranged according to the subject intended to be described in the category. All questions on the cards are given in the Appendix part.

In the design of the cards, the silhouettes of the characters created for the game in advance are used. On the front face of the cards the color of the category and the logo were preferred. So, it was possible to answer the questions without any disorganization throughout the game. On the wrong side of the cards, there are the questions prepared and the numbers to easily find the answers from the answer key. The scales and types of question cards prepared are shown below.

Figure 54: Cards (own figure)

Figure 55: Cards (own figure)

19.5.6 Award

There is an outcome intended to reach at the end of the fun time spent in games; this is qualified as winning the game played and winning an award. Award is used as a motivating factor in game setups. These awards should comply with the audience (cf. Yılmaz 2017, 121).

Based on these information, the award preferred for Be The Next Hero game is the "bravery certificate" to be given to the players after the game. For this, at the end of the game the moderator should go to the web page of Be The Next Hero after determining the winner(s) and using the code on the rules guideline, print the certificates by typing in the names of the winners. Each box contains one code and the code may be used for multiple times. Thus, with the certificates the players obtained through the didactic game, they want to acquaint themselves more with the subject and this provides inner motivation for the players. As mentioned by Yılmaz (2017), when inner motivation is provided, the player would like to play the game again even without an award and learn more about the subject by being aware of its benefit for him/her. So, the information they obtained throughout the game becomes habits in their lives and the player may enjoy the game in the same way every time he/she plays (cf. Yılmaz 2017, 122).

Figure 56: Webpage (own figure)

Figure 57: Certificate (own figure)

On the certificates given, there are the signatures of Tom and Milo. By this way, the players are recorded as the next hero officially.

19.5.7 Box

To protect the content of the game box from physical effects like impact or damage, it is made of gray "kappa" cardboard material. In the packaging, 170 g matt paper was preferred. The dimensions were determined according to the game board and question cards designed in terms of portability function. The dimensions are shown below.

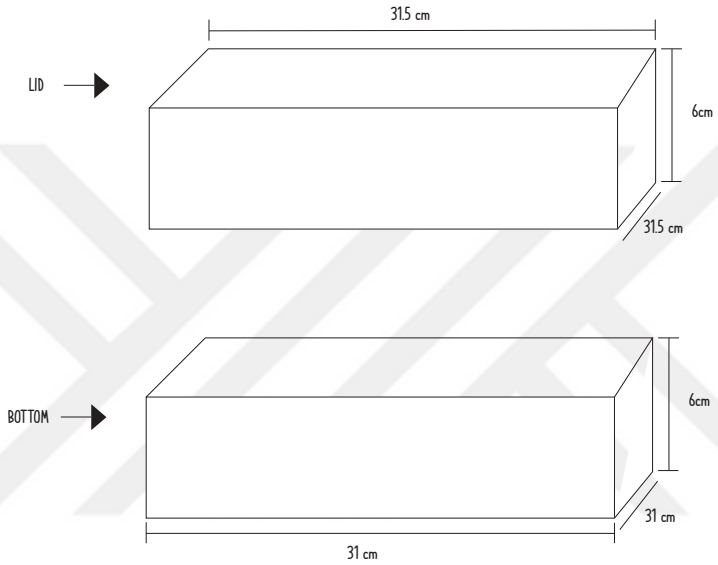

Figure 58: Mesurements of the box (own figure)

While designing the packaging of the box, colors that match the game overall and which may attract the attention of the target audience were used. To reflect the character of the product and to present the target audience that the product is a didactic question game about earthquake, simple packaging was designed. For the packaging designed to become the icon of Be The Next Hero brand in the future, the integrity of the packing with the brand was considered.

Figure 59: Final Design of the box (own figure)

To avoid the warm colors used on the logo and the characters of the game straining the eyes, the light gray color also used on the game board was preferred as the main color in the packaging design. To maintain the tranquility and the modernity feeling created by this color, the design was finalized with orange. Thus, the logo intended to be emphasized stood out.

On the front cover of the box, there is the logo and the primary information indicating the features of the game. On the back cover, there are information about the game content, message intended to be conveyed, a summary of the rules, warnings and contact details of the brand. Symbols used in the packing design give visual clues to the target audience about the features of the product.

Every information used on the packaging were arranged in compliance with the purpose of the game and in a legible manner. As it is aimed to convey the required message to the consumer within a couple seconds, short and clear statements were preferred in the texts prepared for the packaging. With this study, it is targeted to convey the kind of product in the packaging and the features of it through the packaging design.

Figure 60: Be The Next Hero in the classroom environment (own figure)

Figure 61: Be The Next Hero (own figure)

20 Business Plan

The business plan addressed in this chapter focuses on Be The Next Hero product. In the business plan prepared the matters like the identification of the product, for whom it is designed, its mission, values, targets, service features, market analysis and marketing concept are discussed. In the next chapter, these matters will be explained in detail.

Be The Next Hero is the name of both the game and the recently created brand. The brand focuses on natural and man-induced disasters within itself and aims to design new educational games and projects. Therefore, this game on earthquake would be considered as an infrastructure and help in determining further games and the content of the game during the project design based on the needs of the new target audience. This business plan is very important in order to secure the position of this first product designed in the market to be able to create more different and new designs in the future.

The product developed increases the awareness of the society for risks and helps them to be prepared for dangers.

20.1 Product Description

20.1.1 Name

The name "Be The Next Hero" was created by being inspired from a person wise, helpful and brave in dangerous cases. This term was preferred to motivate and encourage the children intended to be educated on earthquake.

20.1.2 Background and Idea

Games are as old as the existence of human and games and game based learning are methods used for so long for matters that should be learned through experience. Within this context, it is possible to that games are used in many areas as they became a part of the daily life. People who buy and play games may make decisions more comfortably and without being afraid of making mistakes as they face a less risky environment during the game compared to real life. Thus, the learning process takes place and they are more wise and cautious when they face a risk mentioned in the game in real life. The learning process begins with the experience they gained throughout the game and the player attaches more to the game (cf. Yılmaz 2017, 4). The developed product, Be The Next Hero, ensures fun learning and emphasizes the matters that should be learned about earthquake. Besides, while this game helps the realization of meaningful and effective learning, it also contributes to the social skills of the children. By this means, the children with rein-

forced social skills gain teamwork habit and improve their friendship. In this context, it is seen that Be The Next Hero brings many benefits to the player in numerous aspects.

As the game is portable and does not require Internet or being charged, it is possible to play with it anywhere. For this reason, the consumers purchasing the game may use it both indoors and outdoors.

> *"Asserting that there would be no earthquakes in Marmara is like asserting that a mountain with a crater lake at the peak was not once a volcanic mountain." (Bayarslan 2011, online) (translation by the author)*

Today, as the population in Turkey increases towards the urban areas, the activities conducted on awareness for earthquake fall behind. This product should be considered as a part of the education aspect of disaster management planning to prepare the society for earthquake. Thus, latest by 2025 it will be possible to be prepared for the expected "Great Istanbul Earthquake" of an intensity of 7.4-7.6 by informing the society.

20.1.3 Target Group

The target audience of the game consists of children at the age of 9 years old and above. Hero game is designed to allow children to play with their families and friends.

20.1.4 Benefits of the Product

Although there are many didactic products designed and many activities performed in Turkey, unfortunately there are no studies conducted on such an important and dangerous issue like earthquake. Therefore, Be The Next Hero has the potential to be an example for many studies in the future. The benefits of the game for the consumers should be considered in terms of educational, social and mental aspects. In terms of education, the consumer learns a matter which seems difficult while having fun and his/her learning ability is increased. Besides, this game allows the things learned to be implemented in real life and helps improving attention deficit disorder. In social terms, it intends to get the player adopt to group work and thus, develop his/her communication skills. Mentally, the ability of expressing of the players develop and they are enabled to establish cause and effect relation through systematic thinking. By drawing the attention towards the problem with the question cards in the game, both their awareness of the problems increase and their memory develops. Be The Next Hero distinguishes from many educational games in the market with these benefits.

The game should be replayed every 4-5 months to remember the knowledge learned through the game and maintain its efficiency. Otherwise, it is likely that the knowledge learned are forgotten and thus, the learning might not be sound.

With the aforementioned benefits, Be The Next Hero is offered to the consumers with the content and the designed prepared.

20.2 Brand Values and Principles

Determining the brand values and the principles properly is important for that brand to be long-lasting (cf. Rue, Byars 1995, 64). For this reason, while creating Be The Next Hero brand the values and principles are regarded.

Earthquake is a matter that should not be forgotten. Especially when the experiences in 1999 Marmara Earthquake are considered, Be The Next Hero undertakes raising awareness about earthquake in the society as a duty. So, Hero has a mindset against fatalist ideas and ignorance.

The most important benefit that the consumers would gain with this game is individually being prepared for a possible earthquake with the knowledge and experiences obtained. In this context, it is obvious that the more accurate information individuals have about earthquake, the more possible it is to survive and to overcome with minimum loss.

At the design stage of this game, which was prepared based on 1999 Marmara Earthquake, the cultural background of Turkey was considered. Besides, the messaged intended to be conveyed with the brand name preferred and the logo design is that it is possible for everyone to become a hero through the knowledge gained. Thus, it is emphasized that education would solve many problems.

Besides, being efficient by working hard, turning changes into opportunities rather than considering them as threats, and performing quality, cheap and fast production to obtain competitive advantage are the topics mentioned in the values of the brand.

20.3 Mission

Be The Next Hero aims to educate and to inform users about a possible earthquake by raisin awareness against earthquake in Turkey and by transferring useful information. The game content and design provide a service that would change the learning habits of the target audience.

A society with increased awareness may cope with the future problems more easily. Therefore, it is very important for Be The Next Hero to remind the importance of disasters like earthquakes to the society. This approach is also valuable for the country in terms of social responsibility. With this mission undertaken, it is intended to provide a benefit to all shareholders (children, schools, teachers, parents, government, municipality).

20.4 Vision

Be The Next Hero's vision is determined as "being a company that raises awareness against risky cases in the society and designs the best educational games of Turkey".

Determination of this vision has a great importance in setting the medium term and long term targets of Be The Next Hero.

20.5 Internal Analysis

Because Be The Next Hero is a small company run by a single person designing educational games, it is not possible to make a current analysis of the organization and the human resources. Once the product design is finalized, the company outsources the manufacturing to a contracted press company. Thus, it works fast and in line with its values. After the brand awareness is established and after gaining a profit, it would be possible to grow and regenerate within the company. In this chapter, the consumer analysis, targets and production costs of Be The Next Hero are mentioned.

20.5.1 Company and Management

As Be The Next Hero is a small company, there is no need for a large capital for the start-up. The company may start working after completing the company registry. The founder, director and the designer of the company are the same person, so it ensures preserving the values of the brand, adjusting the cost in a reasonable manner and not distributing the earning. Depending on the income earned by the company, it is possible to hire new employees. The expansion of the company depends on the competitive advantage it would get in the market.

After marketing its first game, Be The Next Hero brand is planning to design new games by analyzing the other risk cases in the world and have them manufactured by the contracted press company. The earthquake version of Be The Next Hero has been the beginning of these plans.

20.5.2 Consumers

Be The Next Hero consumer wishes to be informed about incidents with bad outcomes like earthquake and to be more conscious in the next earthquake. For this reason, the product is expected to provide fun learning. As it is seen in the data obtained from empirical studies, the society lacks information about the earthquake concept and being prepared for an earthquake. Therefore, consumers who will purchase this product constitute of people who want to gain sense of responsibility, increase their awareness on risk

cases, and to grow stronger against earthquake. These consumers are also high-income people who think that the current education system should change; who have tendencies about the future; who want the society to change favorably; and who has ideals.

Although the target audience of the game is considered as 9-year old and older students, it should be noted that the parents, schools and teachers are the customer ready to pay for the game. Because to educate the children, first the parents and the educators should be educated. The support from these people while learning would cause the child to play the game with great pleasure and eagerness. Therefore, the table which is created to review the ideal consumer criteria and what may satisfy them and which shows the target consumer of the product is given below. This table reflects the ideal consumer analysis demographically and psycographically.

	Demographic	Psycohographic
Kids	- Age 9 and up - Girl and boy - Student	- Willing to learn new things - Curious about natural disasters - Enjoys playing board games - Wants to feel safe - Be distracted easily - Wants to enjoy the lessons - Wants to have fun while learning
Teachers	- Age between 25 to 40 - Male and female - A person who speaks foreign languages	- Cares about the environment - Cares about the students - Sensitive to social issues - Open minded - Sensitive to risk situations - Idealist - Affactionate - Be open to innovations in education system
Parents	- Age between 30 to 40 - University graduate - Working parents - A person who speaks foreign languages - Upper middle classes	- Open minded - Sensitive to risk situations - Take care of their children - Well educated - Interested in innovations - Sensitive to social issues

Table 13: Demographic and psychographic table of the consumers (own graphic)

This game which increases the earthquake awareness intends to educate the players by relieving them from stress and anxiety. In this context, to understand what the consumer wants, it is important to analyze the psycographical factors as well as demographical factors. Psycographical approach which addresses the behavioral variability affects the psychological characteristics and the mode of living as well as the decision-making mode of the consumer. For this reason, for the product marketed to be successful, these factors should also be reviewed (cf. Akın, Yoldaş 2010, 6).

By analyzing the psycographical factors, the satisfaction, pleasure and the relief of the consumer after playing the game was considered at the research and product develop-

ment stage. For example, the rules of the game are established by analyzing the psycographical factors to maintain the interaction between the children and to prevent distractibility and boredom. Thus, a game which makes children happy and satisfied has been achieved. The reason for considering these factors is to make the consumer feel the desire to win and fear of loosing with the pleasure granted with the game. This approach favorably affects the sales of the product through factors like deciding, purchasing and taking an action.

Be The Next Hero exists in the market with an approach focusing on customer satisfaction. The game was produced to allow people to express their ideas freely in line with the company's innovative values against bigotry and ignorance, not to be afraid of making mistakes and to gain experience in the game by learning. Thus, it obtains competitive advantage in the market.

Because Turkey is located on an earthquake belt due to its geographical location and an earthquake with 7,4-7,6 intensity concerns overall Turkey with 80 million population, especially Istanbul with 20 million population, the consumer number of the game will increase in the future. Therefore, Be The Next Hero is a game that will be beneficial for the whole country.

20.5.3 Goals

In the strategical planning process, the targets answer the question "where we want to be in the future". For this reason, it is very useful in terms of showing whether the strategic purposes are realistic or not. While determining t he targets, it should also be consistent with mission review and the budget process (cf. Schermerhorn, 1996).

Be The Next Hero, which addresses the risk cases and disasters, intends to increase the awareness in the society about the existing problems and to develop educational games for mitigating the damage. To reach this target which serves the purpose of the brand, 4 areas of success to get success are determined. These areas of success are shown in the table below.

Table 14: Determined success areas (own graphic)

Separate targets are determined for each area of success and studies were conducted over the most amenable one in terms of time and budget by conducting duty analysis. Due to the novelties in the fast moving goods and market areas today, a target plan for maximum 5 years was prepared.

Targets determined in research success area are the earthquake concept, determination of physical and psychological problems occur after earthquake, coping skills, making an extensive research on things to do at preparation stage and to create the solution required to satisfy all shareholders. These targets determined are established as targets planned to be realized in short-term. For the future renewals of the project, the targets determined to be realized in the coming years of the research part are conducting additional researches and analyzing these researches based on shareholders. These targets are expected to be shaped in the forthcoming years based on the content of the new product or the service to be provided.

One of the targets determined in development success area is to have the researches fully accomplished and to design a product which would increase the people's quality of life in short-term with regards to the problem determined and to make them feel strong in face of earthquake. For Be The Next Hero to leave positive impacts on all of its shareholders, the product is intended to solve problem at a large scale. Editing the product designed to suit the age of the child, clearly explaining the rules to the children and to conduct the required activities to make this product CE certified (European Conformity) are of the targets that should be achieved at this stage. According to 1-3-year target plan of this product designed, it is targeted to implement different versions according to the education and risk concept, to design games specific to customer, to make digital applications and to prepare larger projects (like designing parks, school gardens) to be used as a tool in social responsibility projects.

Before starting to work on marketing success area, the target is set as creating a brand, i.e. recognition of Be The Next Hero by everyone in the world rather than product promotion. The studies performed in this area do not aim increasing the sales of the product but putting continuity and brand habit to the forefront. What is important here is to establish a dependency of Be The Next Hero brand in all shareholders and to gain their trust. By this way to ensure that the current product or the products or services planned to be realized in the future are long-lasting For this reason, the studies performed on brand recognition of Be The Next Hero were considered long term rather than short term, and studies were performed on customer satisfaction rather than the income. For example, giving importance to the promotions at schools was preferred to increase the brand awareness rather than gaining profit over the schools. By ensuring the satisfaction of the teachers, students and other officials at the school during the promotion process, it is possible to have other masses to ask for more information about Be The Next Hero product. In line with this target, it is intended to be recognized, sold and gain income in channels other than schools. In the planned promotion activities, using the consumer itself as a means of promotion may be addressed as one of the marketing strategies.

Besides, with the marketing strategies prepared, the long term targets of Be The Next Hero were set as being valued before the government, reaching masses in different platforms by being modified and providing benefit to all shareholders, and being the most requested educational game in the market.

After completing the required tests and certificates for the product and obtaining CE stamp, the profit and loss calculation of the game aimed to be launched in terms of financial success is shown in the following table. A five-year plan has been established by determining the income distribution of the consumer group and the economical factors.

	Unit	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Year 5 Total
Sales Volumes	piece(s)	1,035.0	1,327.0	1,703.0	2,187.0	2,811.0
Sales Revenues	EUR	20,552.0	31,849.5	49,502.8	77,114.8	120,411.5
Cost of Sales	EUR	10,648.4	15,356.5	22,167.3	32,020.2	46,292.7
Gross Profit	EUR	9,903.6	16,492.9	27,335.5	45,094.7	74,118.8
Operational Expenses	EUR	5,147.1	4,214.7	4,740.7	5,332.3	5,997.8
Operating Profit	EUR	4,756.5	12,278.3	22,594.8	39,762.4	68,121.0

Table 15: Profit and loss calculations (own graphic)

The cost sheet prepared was calculated weekly for the first four months and then calculated as monthly. The calculations targeted for the future were made with an increase by 20% and 30% per year. These calculations were addressed to realize the growth, profitability and value creation of the brand. According to the cost report targeted, the sales volume increases after the first two weeks and profit is obtained by the end of the second month.
While making the financial calculations, the costs were grouped as school channel and out-of-school channel. Thus, the profit to be obtained from each area is clearly understood. While calculating the expenses, the needs during promotion process, the design studio planned to be rented later and the other expenses required for the growth of the brand are considered.

The cost of sales is 10.648 Euro and the profit at the end of the first year is 4.756 Euro . The profit obtain is expected to increase within five years with the plan prepared. All calculations are converted from TL to Euro.

20.5.4 Production Costs

The advantage of the board games compared to other games in terms of production is that it is being manufactured in printing sector. As this is a developed sector in Turkey, the materials of the board games played on table may be produced in Turkey with quality (cf. Rüşvanlı 2007, 43). The low cost of all paper, cardboard, coating material, plastic and wooden materials required for the games allows manufacturing the game with a more affordable price and higher quality. Besides, the games manufactured in a print shop may be manufactured faster. Therefore, it is possible to proceed to production phase after design phase within a short time.

The manufactured parts of Hero game are game cards, board, packaging, pawns and rules guideline. The price obtained from the printing company for 100 units as serial production was calculated as 5000 TL - 1000 Euro. It was decided that 100 units were enough for the early stages of promotion period. Besides, pursuant to the agreement made with the printing company, it is possible to make a fast production when extra products are needed.

20.6 External Analysis

20.6.1 Current Status of Game Market in Turkey

When the place of Turkey in game sector is reviewed, it is seen that it remains in lower ranks in world market with approximately 180 million US Dollars annually.

Today, due to the intense political, economical and socio-economical problems of Turkey, the game sector was not quite taken care of. Therefore, this sector, left to its fate, tries to survive with many toy companies closed and with imports by the remaining companies rather than export, and by using the current capital. Unconscious import is said to hinder development and progress (cf. Rüşvanlı 2007, 29).

One of the problems incurred by the sector compared to its foreign competitors is the inability to develop a genuine concept. For this reason, the toys made in Turkey require new creative projects in order to prove themselves in the world market. In order to increase exports, it is also important to improve the perception of quality of the toys made in Turkey. This requires attaching great importance to product development process, increasing the quality and good marketing strategies to enhance the company image (cf. Pagev 2017). As a result of not valuing new product development and design, today it is seen that there are many companies importing games to Turkish market but a few manufacturing companies. The companies in Turkey should resort creating a brand through genuine designs by taking European and American companies as example (cf. Rüşvanlı 2007, 30).

Another important mistake in Turkish game market is not giving due importance to investment. Regarding the quality and investment shall ensure an increase in the product quality and sales in medium term and an enhancement in brand image (cf. Pagev 2017).

Games are important for reflecting the cultural values and for the future of the children. Therefore, domestic toy industry would enrich the country's culture while providing added value to Turkey's economy and employment Information, basic ethical and cultural values which are intended to be conveyed to children may be provided through the toys manufactured (cf. Pagev 2017).

The manufacturing license obtained by the manufacturers in Turkey is not considered valid in Europe. So, a company which would like to expand to Europe from Turkish market first needs to create a genuine design and a brand identity, then develop the product according to the rules and laws of European Union and obtain the required license (cf. Rüşvanlı 2007, 30).

20.6.2 Competitors

For a business or a brand to be successful, it should fulfill the requests and requirements of the consumers in the target market better than its competitors. Therefore, it is important to know its existing competitors very well (cf. Özgül 2001, 121).

When a market analysis was performed, it was determined that there are many competitors designing board games serving different purposes like fun, strategy and education, but in this market area there are no games available prepared for natural disasters like earthquake. This market analysis is addressed in Chapter 18 in detail.

The only competitor of Be The Next Hero in the context of earthquake issue is the earthquake bags prepared after the earthquake. It is possible for the public to feel themselves prepared for the earthquake with these bags. However, these bags still remain in the way they were prepared 18 years ago without being updated. For this reason, with the values of Be The Next Hero such as awareness, remembering and staying up-to-date, it gets ahead of the earthquake bags. When the problem occurred is analyzed, it is obvious that new methods are required to be prepared for the earthquake and to increase awareness.

When the educational games in the market are considered, Be The Next Hero need a good marketing strategy to prove its existence in the game sector.

20.6.3 SWOT Analysis

SWOT analysis constitutes a consideration model both as a way of approach and an analysis technique in the strategical planning process. This model forms the basis of the de-

cisions both while gathering and interpreting the information (cf. Küçüksüleymanoğlu 2008, 407). For Be The Next Hero to enter the market successfully, strengths, weaknesses, opportunities, threats should be determined and the SWOT analysis prepared should be shown in the following table. The SWOT analysis constitutes an important infrastructure for the strategic decisions made.

STRENGTS	WEAKNESSES
-Emotional concept -Local Production -Effective and Understandable Communication -High quality standards -User satisfaction -Reliable brand profile -Domestic product -Affordable price -Drawing attention of children	-Not an established brand -Lack of a large distribution network -New to the market -Absence of a strong competitive advantage -Risky promotion planning
OPPORTUNITIES	**THREATS**
-Parterships -Expansion out of Turkey -A brand not widely recognized -Carrying the project to larger scales; like parks and school gardens -Cooperating with the municipality -Putting the game into the curriculum -Having a lot of shelves in the market -Increasing the product range every year -Evaluating the need for educational games in the world market	-Failure to derive profit -Digital world -Continuous introduction of new games -Not being accepted in the market -Failure in product marketing -People giving up toys sector -Being affected by the economic crisis in Turkey -CE marking

Table 16: SWOT analysis (own graphic)

The current weaknesses of Be The Next Hero game are considered as being new to the market and not to have a long rooted past. In this context, it does not have a strong competitive advantage in the market. But a few studies on earthquake, lack of importance given to the information on the disasters in the society and education falling short in this area will allow the product to hold a sound place and progress in the market with its educational aspect. Therefore, it promotion activities should be valued a lot. For this, promotion days at schools, in shopping malls and fairs will be effective.

It is possible that the product will not derive profit during the promotion period. However, the brand recognition achieved and the reliable brand profile conveyed to the consumer should be considered as a step to be taken for the future profits.

As well as the reliable profile of the brand, its affordable price also favorably affects the purchasing decision of the consumer. Thus, Be The Next Hero game may reach many segments and it is possible to have more shelves in the market in the future.

Today, children are have more influence on the consumption patterns of the families than in the past, and for this reason, the children's influence on their families' purchasing decision/their power to have something purchased gained a strategical importance in the marketing plan of the product (cf. Gülerarslan, 126). Therefore, drawing attention of the children is effective on the purchase of the product and the brand to become recognized. During the development phase of Be The Next Hero game, emphasizing the features that may attract the attention of the target audience and that will ensure their satisfaction is among the important activities performed to reinforce the place of the product in the market.

Upon gaining a seat in the market through the user satisfaction provided by the product and with its reliability in the market, it is possible to realize the opportunities like carrying the project to larger scales (new ideas which may be designed for playgrounds, school gardens), cooperating with the municipalities and introducing the game into the curriculum.

Digital world, computer games, telephone applications are of the greatest threats for Hero. But, when the product profile of the brand and the values defended are reviewed, it is possible to convert this threat into an opportunity. For example, for the games played over Internet, resources like electricity, and Internet are required. Upon a possible electricity or Internet interruption, it is possible that the game is left half finished, the hormone of happiness decreases and stress starts. This may be because of the people, especially the children's, addiction to the games they play. Having a real game that they can play without needing batteries, charge or Internet makes it possible to play anywhere. Places like seaside, camping areas may be shown as examples. Besides, these board games designed for educational purposes enables communication between people in real environment. It is hard to achieve the real sincerity on virtual platform. For this reason, sharing emotions and tasting the winning and losing feelings together in games played mutually around a board also support social development of people.
According to some pedagogues, the children who get used to solving problems with a single key in computer games cannot solve problems in real life and become aggressive. Therefore, for children not to forget the difference between the real and the virtual world, the existence of the traditional games should be maintained (cf. Gürcan, Özhan, Uslu 2008, 8). In this context, Hero game enables children to cope with problems in real world.

By evaluating the aforementioned strengths and weaknesses of Be The Next Hero, many progresses are made in opportunities area and activities are performed to mitigate threats.

20.7 Marketing

Regardless the product introduced to the market, there is a value purchased by the buyers. These values correspond to product, price, place and promotion in marketing (cf. Kotler 2000, 136).

20.7.1 Product

As mentioned in overall business plan, the product arouse from the needs of the society for getting informed about earthquake and being prepared for an earthquake. Therefore, it has a beneficial place in the society which may help a change in positive direction. With Be The Next Hero, the awareness on earthquake is increased. Thus, individuals, especially the children, will perform activities to mitigate the possible damages instead of being afraid of the earthquake concept.

Figure 62: Be The Next Hero (own figure)

20.7.2 Price

> *"Price gives an idea to the consumer in the perception of the product and the evaluation of the product and the brand" (Yükselen 1994, 74).*

In this context, while determining the price of Be The Next Hero game, the target consumers were analyzed carefully. As the consumer would prefer the product from which it will obtain the most benefit for the most affordable price, a consumer-oriented approach was adopted in pricing. By considering the table in market positioning determined

through the market research conducted, a proper pricing was made for the game upon calculating the costs and expenses.

As it is an educational game, the price for the channels out of school is 100 TL - 20€ and 80 TL - 16€ for school channels which is a more affordable price. This is because there is no intention to profit from schools as mentioned in targets chapter. According to the marketing strategy determined, it is expected to increase the sales in out-of-school channels through the schools and to gain profit. Besides, based on the targets determined in the financial success are, the price increase was determined as 30% for out-of-school channels and 20% for school channels.

20.7.3 Place

The place where the product is sold, is the marketing component bringing the product and the consumer together. The easier the consumer meets the product, the more the product is remembered and the more positively the purchasing behavior is affected (cf. Kurtoğlu 2007, 127). Due to these reasons, Be The Next Hero product is offered for sales in booths set during promotion period, in toy shops, bookstores and online through its own website.

Figure 63: Ezample of Be The Next Hero's online store (own figure)

20.7.4 Promotion

As a marketing component, promotion provides the communication between the consumer and the product. So, with the marketing strategies developed based on communication efforts, the product is successfully promoted (cf. Sirgy 1998, 74)

In today's time period named as consumer century, it is hard to convince a consumer to choose a certain brand among many brands in the market. For this reason, promotion activities in line with the customer expectations, requests and needs would facilitate increasing brand awareness in the society (cf. Altunbaş 2007, 157).

Certain promotion ways are determined for Be The Next Hero product to show its existence in the market in Turkey. These are the advertisements in the magazines, booths in shopping malls and fairs, promotions in schools and the activities conducted via social media.

Figure 64: Example of Be The Next Hero promotions (own figure)

The promotion activities held in schools and shopping malls are expected to affect the future profit of the brand favorably. The reason for choosing shopping malls for promotions is that the number of such places are very high in Turkey and the intensity of the visits to shopping malls by Turkish society. These places, which are especially overly crowded on Friday, Saturday and Sunday, are ideal for promotion. These locations where the promotion activities will be conducted through the booths rented cover the shopping malls in regions of Istanbul like Beşiktaş, Bakırköy, Levent, Şişli, Bostancı and Kadıköy. This is because these regions are open for innovations and have high education levels. Following the promotion activities in these regions, it is planned to include the other regions of Istanbul and other cities of Turkey in the promotion process. Because of the demand to the shopping malls in Turkey, it is possible to gain high profit in the right region, with the right positioning and the right product.

In the promotion activities held in schools during weekdays, workshops about earthquake and the game where the students and teachers participate are organized according to the permits granted by the school officials to better show the benefits of the product. Thus, the advertisement of Be The Next Hero will be made with word of mouth.

These promotion activities cover a period of six weeks and not much profit is expected during the promotion period. At the end of six weeks, re-organizing promotion days at schools from time to time is added to the plan list to remind the severity of earthquake issue. In the cost report issued as per the financial targets, it is seen that profit is obtained eight weeks later. This table is shown in Appendix part.

Today, the influence of social media on the society is obvious. On the social media platform prepared for Be The Next Hero, posts about the visuals of the product, production stages, promotion days at schools, pictures from the workshops, announcements on the place of the next promotion will attract the attention of the consumer and arouse their curiosity about the brand. The outcome of effective use of social media will also be positive. This method is a low-cost method with high numbers of masses reached compared to traditional systems (radio, television, magazine, etc.). Therefore, in promotion activities of Be The Next Hero brand an great importance is given to social media.

The brand also supports the social responsibility projects on earthquake and other risk issues in line with its values and principles. These activities are non-profit activities and they contribute to the development of the brand's image in long term.

Figure 65: Example of Be The Next Hero promotions (own figure)

V Final Conclusion

The purpose of this thesis is to produce a marketable, practical and a beneficial product based on the findings of the theory and empiricism made. The research questions were asked to understand the main problem, which occurs due to the earthquake in Turkey where there is a high risk of earthquake. With the product designed according to the data obtained, it was intended to raise consciousness about earthquake in the society, expand the awareness and help people be individually prepared for a possible earthquake.

It is possible to implement many different methods and techniques to get informed about earthquake. Be The Next Hero game makes the subject attractive to children and ensures fun learning. Besides, while the children get informed about earthquake through the game, they also develop their communication skills. By this means, they strengthen their friendship and gain teamwork habit. So, this game designed has many social benefits as well as being a didactic game. A different perspective was brought to expanding the awareness on earthquake with this game. The success achieved by this game shows that board games may be a useful material in education.

For the product to attract attention around Turkey, it should be promoted in schools in every city. To open up to the world, more interviews and test studies are required. Besides, translations based on the target country where the game is intended to reach may be considered, This game, which is a good example for informing the society about earthquake and having them get prepared even a little, should be considered as a beginning and it should be diversified with more researches For the Be The Next Hero game brand, which may be an example for didactic games at schools, to expand and reach the large masses, it is necessary to focus on promotions in the schools. Meetings should be organized with the Ministry of National Education for this game to be used as an educational tool included in the curriculum.

Figure 66: Final Product (own figure)

Figure 67: Final Product (own figure)

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Appendix

Appendix I: Summarize of the Focus Group Interview Questions and Answers (translated by the author)

Can you tell us how you felt at that moment?

Interview A:

"It was 03:00 A.M. when the earthquake occurred. It attracted our attention that the weather was very hot before the earthquake, but of course we didn't thought of the possibility of an earthquake. We woke up with a blowout. It was such a strong sound that it raised us from our beds. The trembling at the moment we raised was something we had never experienced so far. It was like you were on a boat in a rough sea and you were shaking. It was more intense than the earthquakes we had experienced until that day. It also lasted very long. We got out with a noisy clamor, thanks God our building was standing but it is very difficult to describe the fear I felt at that moment..."

Interview B:

"After feeling that great trembling, I thought how could we get out. We were in an apartment block of 7 floors and I thought what if the stairs were collapsed. Seeing that the stairs were solid, I took the kids and went out. I didn't know anyone outside, but there was ambient like a nightmare. Collapsed buildings, people crying. It was terrible. We gathered with my neighbors. As there were no meeting place determined for us, we used the playground as the meeting place. Everyone was sharing. In the meantime we heard that a fire started at Tüpraş due to the earthquake. In the news it was said that the fire was very severe and that everyone in the vicinity should move away. All of us got in the cars and started to escape as if a volcano had erupted. People who didn't have a car got into the cars of others. Everyone was trying to run towards the highlands in a convoy. There were no places where we could buy food or beverage. It was a matter of life and death. We spent 4 days in an open forest. It was really hard. We had nothing to get heated. People living in the villages around shared their food with us. We got help which the government failed to provide from people. As we struggled to survive, we learned that the fire was extinguished. We heard that there were no losses but if there had been an explosion the entire Marmara Region would have demolished. Then, our escape would have no meaning. After the news about the extinguishing we returned but we couldn't get into our houses because of fear, so we lived in the living space we established in the park for a long time...

I was concerned rather than frightened because I had experienced an earthquake before and I was more frightened at that time as I didn't have any experiences. This time I first thought of my children. I was concerned about how could I take them out, how could I rescue them"

Interview C:

"I tried to go to the children's room as the quake continued but I couldn't manage to stand, I fell off and went to the children by crawling. Just then the ironing board behind the door fell and blocked the door. I was not able to reach the children because of that. I was so afraid of being unable to rescue them... I got contracted at that moment due to fear and panic, I couldn't do anything. Kids were more reasonable right then and they managed to open the door. Then we went out; everyone was already outside. What we lived in the park were similar to what Nuran (Interview B) has told. This earthquake affected my husband the most. He went to a psychologist after the earthquake and he hardly overcame that trauma. We built a prefabricated house in the park and lived there for a year, my husband on no account stepped in the house..."

Interview D:

"The building collapsed over me before I understood what was happening. I thought I was dying. It was like a nightmare, I was very frightened and worried thinking what if I couldn't make it out of that debris..."

How do you think the society get over after the earthquake?

Interview E:

The earthquake did not only devastated the city but it also wounded the people deeply. When the people learned that they lost their family, they couldn't rejoice their survival. There were injured people, deaths, collapsed buildings everywhere. They were not easily erased from the memories. This society hardly overcame the impacts of the earthquake. I think we still have fears inside that we could not get over"

Do you have any habits from that period? If any, can you tell us about them?

Interview A:

"Once, seeing the stuff we prepared for earthquake (like torch, whistle) affected us. Now they became a part of our lives. We no more live as if an earthquake would occur; we say what would we do if it happens. Therefore, seeing those stuff makes me feel safe. We keep them prepared as a precaution. Besides, I had never closed the

door of my bedroom ever since that day. As we experienced the earthquake at night, I feel as if it will happen at night again. So I am not closing the doors of the rooms, in fact I check, correct the stoppers we placed in front of them every night just in case"

Interview B:

"We were under the influence of earthquake for many years. We feared thinking what if it happens again. Therefore, I never place anything behind the doors. I learned this after the earthquake. I leave the exits clear. To prevent any obstacles if we need to run. I always put some clothes by the outer door which we can take as we leave. We also keep a torch and a whistler by the bedside"

Interview D:

"As I was rescued under the building, I don't feel well in narrow areas anymore. I always keep a torch and a whistler by the bedside. Those stuff do not scare me but make me feel safe. I tell myself that this time I can show my location more easily, but I won't live through such an incident again"

How would you define the psychological effects of the earthquake on you? How did these effects influence your living?

Interview C:

"We always fear that an earthquake may occur at any time. Although we do not speak of them, we have fears left from that time. For many years, I never wanted my children to stay elsewhere thinking I could not reach them in case of an e-arthquake. Now, I want them to notify me of anywhere they go. I am restless at all times, I learned to live with the idea of earthquake but I could not overcome my fear"

Interview D:

"It is not quite possible to get over this incident psychologically. Because once you experience such a bad incident, it is not easy to forget. I lost my husband in the e-arthquake and my leg got injured during the earthquake because I remained trapped under the debris for 24 hours. These are the traces I will remember all my life. I am grateful that I survived but I can never forget the fear and the fuss I felt. Now when I go into a closed, narrow place or when I hear a very loud noise, my fear shows up again. We learned to live with what happened to us during the earthquake but this earthquake terribly affected us psychologically. I had never talked about it for 18 years; today is the first time I talk. I guess I had never been ready to face the truths until today"

What were the needs after the earthquake?

Interview B:

"We could not return to our houses for a long time after we left. We were afraid of aftershocks. I think one of the most important needs when outside was the restrooms. Then a place to shelter. A shelter is important as we used to stay on the street because we could not return our homes. For example, we settled in a park within the area. We erected out tent and even solved our toilet problem through our own means but not everyone was as lucky as we did. Not everyone had the enough material, stuff..."

Interview A:
"Drinking water is very important, during that period many people got sick from the dirty water. Besides, the earthquake was on August, it was hot in the daytime but cold at night so we needed a place to shelter and blanket to warm up"

Interview D:

"When I was rescued under the debris and got out, I was chilled; I was completely wet because they watered the location where I was under the debris with a hose. When I got out I needed cloths and a blanket. Then we needed water and food as our houses were demolished. Everyone was sharing what they had with others. It was very difficult to survive otherwise"

How did you fulfill your needs like food, beverage and water after the earthquake?

Interview B:

"Unfortunately the aids arrived very late. Therefore, we arranged everything through our own means; this included fulfilling our food and beverage needs. Those whose houses are standing went to their houses and gathered whatever they found. Nobody said "this is my food" or "these are my stuff" at that time. Those who had something shared them with those who didn't have anything. We managed like that until the aids arrived"

Interview C:

"The aids arrived one week later so we solved many problems by ourselves. We fulfilled our own needs. Though the aids arrived failed to reach those in need fairly. People arranged whatever needed among themselves at that time"

Interview D:
"We arranged everything we had ourselves. The aids arrived so late that everyone shared what they had with those who didn't have anything. Some people broke the locked market doors and took everything inside. I mean, I cannot blame them, I may not call this theft. Because when one needs something, he/she can unfortunately do anything all of a sudden"

How did you eliminate your problems like sheltering and heating?

Interview B:

"The reason we could not return our houses was because of the aftershocks one after another rather than the fear. Nobody wanted to be in a building at the quake. We erected our tent in the park and started to live there. If you ask me whether someone from the government helped us, I would say no. We did everything through our own means. And there was that Düzce Earthquake on 12th of November. In order not to live through the fear we felt while escaping, we did not enter our houses for so long, and lived in the tent we built"

Interview C:

"We lived in a park in the neighborhood for some time as we could not return our houses. We erected our own tents, and turned the park into a living space as Nuran (Interview B) told. And we did all without any help from the government. But people who were not as lucky as we did had hard times about sheltering"

Interview D:

"It was so cold when I finally got out of the debris. I felt even more cold as my clothes were wet. My brother put a coat he found from a debris on me, and he brought the blankets he found in the area for me to warm up. As you see, everyone warmed up on the streets through their own means"

How were the aids provided?

Interview A:

"People were in a terrible condition, the aids had not reached the earthquake area yet. For one week, everyone tried to manage by their own means. In this way, a cooperation was initiated in the region. Everyone helped each other ever since day one. People shared lots of cloths, food and beverage. Nobody said "I don't know that woman, I won't ask anything from her". We never thought of a feeling called hesitation. Everyone shared what they had with each other. We united to help those in need"

Interview D:

"After the earthquake, I remember Necla (Interview E) helped me to fulfill my needs. She forgot herself and helped me as if she hadn't lived through any difficulties. She gave me a thick vest to put on to protect me from cold. I think people who saw me understood that I needed help. Many people helped me at that time. I still remember the caring approach of other people like Necla. People could say "She needs more than I do, I better give it to her". This is very meaningful"

Can you tell about the disbursement of aids?

Interview A:

"Aids arrived 1 week late. There were toilet tissues, blankets, diapers in the aids, but if you ask me whether these were distributed fairly, all of us would say no. Most people in need could not even manage to reach the aids"

Interview E:

"There was a lot of marauding at that time. There were people who saw and robbed the aid trucks on the road before even they reached the area. I had also seen people who collected the aids distributed although they did not need them. They literally made a stockpile. For example, packs of diapers were found in the house of an old lady who did not need them. Or there was a man who took 20 blankets although he didn't need them. Such things are very wrong but unfortunately true"

How were the briefings about a possible earthquake risk before the earthquake?

Interview A:

"There was definitely no information. We didn't know we were under the risk of an earthquake. After all, everyone was shocked when the earthquake occurred because we were not expecting such a disaster"

Interview B:

"There was no information. Experts acted if there were no such risk. The government made no warnings or notifications about a possible earthquake or to become prepared for an earthquake"
Interview C:

"Before the earthquake, the earthquake subject was taught in the classes a little but it was not a subject emphasized. Anyway, it is not enough to teach it, its importance

should be emphasized and the public should be warned if there is a risk of earthquake. If there had been a proper briefing, nobody would have caught unprepared"

What did you know about what to do during or after the earthquake before the earthquake occured?

Interview B:

"Meetings were held at public education centers but the participation was very low. We don't like seminars or meetings at all as a society. We want to stay at home and be comfortable, and get informed. It is, of course, not possible to provide education in such a situation. Frankly speaking, the education was insufficient. Maybe if the way they provided information and the education were attractive, then the public might have been interested more"

Interview A:

"Informing is something done before the disaster, not at the time of disaster. They didn't told us there would be such a disaster nor explained us what to do in our country. For example, the Tüpraş fire started after the earthquake was announced at the time of fire and we were told to run. Where could we run at that moment. If we had known that there was such a risk in case of an earthquake and what we should do, we would have taken measures. Alright, we might be a little indifferent in such matters as a society, but they might have tried to educate the public somehow"

Interview D:

"They did not organize a meeting where all the people might attend and listen. Education provided to certain people does not count. At the end, the only important thing is how many people were educated on this matter. What is important here is that the government should care about the public and educate them on earthquake. Whatever happened to us during earthquake was the result of our ignorance"

What are the wrongs things you knew about earthquake?

Interview A:

"We had heard that hiding under a table during earthquake was correct, but it was wrong. There is a risk of crush when you hide under a table. On should wait near it but unfortunately we learned it afterwards"
Interview C:

"They told us to stay still if you were caught by the earthquake in bed. We learned that it was such a nonsense idea after the injuries and deaths occurred after the e-

arthquake. To my surprise, we should wait near the bed, not in it. There is a higher chance of survival when there is a safe gap near the bed"
Interview D:

"The wrongest information was to wait under summers. We heard that people stood under summers crushed to death due to the collapsed ceilings. These are all because of misinformation. I am sure everybody thought summers were safe before the e-arthquake. I, for example, survived because I waited in fetal position near the arm-chair. The gap between the stuff creates a life triangle"

Interview E:

"It is evident that the stairs are dangerous; many people trying to get out of the building by running down the stairs died when the stairs collapsed. There were also people waiting under the stairs. They told us later that the stairs were independent from the main building, and that the stairs might collapse even if the building stands. But we didn't know these that is why many people died where they nestled. Maybe, they might have survived if they stayed home"

What do you think about the progress of the earthquake training process today?

Interview A:

"18 years passed and the experiences were forgotten. At least in the government side it is like that. But for the earthquake victims it is not possible to forget that moment. I mean, when we compared with the past, of course there are some studies. We are trying to do something individually but after all that time passed, the case loses its importance I guess. For example, those famous earthquake emergency bags are forgotten in some houses or they do not even exist anymore. Earthquake is quite an important matter, the public, especially the children should be educated on the matter; or at least it would be beneficial to correct the misinformation we have. But at the moment, I don't see great efforts other than those small endeavors. If an earthquake occurs, we may be affected even worse this time"

What do you think about the earthquake education at schools?

Interview A:

"I think the information provided at the schools are insufficient. The children should be provided with a better education apart from learning what earthquake is in geography lessons and waiting under the table during earthquake. The children should know what exactly the earthquake is and what they should do"

Interview B:

"The earthquake subject is taught in the schools because they are included in the curriculum. But I think this education is not enough. How can a child protect him/herself by technically knowing what earthquake is. If there are fun educational studies which may attract their attention, then they would learn willingly"

Interview D:

"We experienced earthquake very closely, so we find what they taught in schools funny because they are insufficient. The children should learn to survive without their parents next to them. The time and place of earthquake is indefinite"

How do you think this process was managed after the earthquake?

Interview A:

"We were not expecting that earthquake. We didn't know that we were under danger. It happened and we had no idea about what to do. I am glad that you were not in Gölcük at that moment because there was a big chaos on the streets. I still remember that horrified moment. People were screaming around, there were so many dead people on the streets; there were no electricity, no food, no water and no warm clothes. So basicly we had nothing when we left the house and we have seen a lot of horrible things. I can only blame the bad earthquake organization. They could do a better job. Human life is important"

What can you say about the security in the earthquake area?

Interview B:

"After the earthquake we were afraid to go back to our apartments. So we lived in a tent for almost a year. I am happy that we had some parks around so we could build our tent. After some months those tents were become our home and we create our own living space there"

Interview E:

"Some people left their apartments and lived in tents. I think after that all the security problems have started. Police were also busy to help other people because there were so many people get trapped under debris. There was a power cut for a long time and a lot of houses were robbed at that time. That's so bad!"

How were your needs fulfilled?

Interview E:
"There were so many things we needed at that moment. But the most important things were food and drinkable water because we couldn't go to our apartment to have them. There was no good organization in the city to provide those things for us. We were waiting so long but at the end we had to find by ourself till the help supplies arrived to the city"

Interview A:

"All the help supplies arrived to the area after one week. It was so hard to find food and drinkable water. I wish they could send those supplies when the earthquake hits Gölcük"

What are your comments on the healthcare services?

Interview C:

"The streets were full of with injured people. There were doctors and nurses everywhere but in my opinion they were not enough to help. Because there were so many collapse buildings and you can imagine how many people needed help at that moment. It is so sad to say but the government were not prepared for that disaster"

Interview B:

"There were so many sick and old people around. They all needed help. I helped some of the old people but I am not a professional so I couldn't do a lot. The numbers of the doctors were not enough to help everyone. And actually, even if you are healthy, you can get sick easily after an earthquake, now we know it"

What are your comments on the psychological services?

Interview F:

"There were many people suffering for losing their relatives. We were also frightened very much and in panic. We tried to heal and calm ourselves down. As the roads were blocked, the aids and the doctors arrived the region in difficulty. They were inadequate in calming people down and treating them..."

What do you think about Search and Rescue operations?

Interview E:

"After the earthquake Izmit/Gölcük was demolished. There were searches everywhere. Some people were searching for their families through their own means while some other ran to collapsed buildings with shovels to help people. There were also the rescue teams but, of course, their numbers were not sufficient. Their job was also difficult because they were trying to rescue people trapped under buildings with 8-9 floors. Not an easy thing to do. They needed to be very careful. The darkness due to the lack of electricity made it harder. Therefore, the operations were not easy. To tell the truth they did their best; aids from all over the world arrived to the region. More people were rescued by that means. I mean, lack of sufficient numbers of rescue teams made things harder…"

What do you think is the greatest problem after earthquake?

Interview E:

"Nothing was organized. Nobody knew what to do. There was a total chaos in the region. The help didn't arrive on time and there were no gathering points. So, what could those people do in that case…"

Interview A:

"There as nothing as organization. Everyone was trying to do something by their own but the people were ignorant about earthquake; therefore, what was right and what was wrong is open to question. Aids which did not arrive was a great problem. It is true that search and rescue operations are very important but without the aids how might those people survive... The ignorance of the people and being inexperiences led to chaos in the region. Maybe, because of this we got over it very difficultly..."

What would you recommend to resolve the problems?

Interview A:

"The government and the relief agencies should be organized better. To prevent a chaos environment, they need to plan what should be done in an earthquake. Besides, they should educate the people on this matter. Everything happened was caused by ignorance. Above all, of course, they should build durable buildings. They risk our lives by stealing materials"

Interview B:

"There should be gathering areas and first the toilet problem should be solved there. At that time we didn't have a toilet and it was so difficult and it invites diseases. They should define the different needs of the people according to age, medical status

and sex, and keep them available in these gathering areas. For example, a building called Hangar was built in Yalova. It is arranged to fulfill the needs in an earthquake. But I am not sure how sufficient this would be. There should be more of such places"

Interview D:
"The society, particularly the children, should be educated. People should know what earthquake is and what he/she may do. Besides, things to do and things to be avoided during and earthquake should be avoided. Since it is hard to make a countrywide organization, then let them educate the society so that people gain consciousness against the next earthquake"

Were you prepared to this earthquake?

Interview B:

"We were not prepared for this earthquake personally or as a society. I think this is the reason for all the problems occurred after the earthquake. We were not prepared neither in terms of conditions nor feelings"

Interview D:

"Never! We were not prepared for that earthquake. After all, the reasons for such a chaos were its occurrence at an unexpected moment and us facing an incident we never knew"

Interview C:

"When I think of what happened, we were not prepared for such a disaster. We didn't know what to do”

What is the condition of your earthquake bag prepared after 1999 earthquake?

Interview A:

"I don't have a bag but I always keep a torch and a whistler by the bedside. I think these are my only preparations for an earthquake"

Interview B:

"My bag used to be ready at all times but one day I realized that everything shrank and spoiled. It is not enough to prepare, that bag should be renewed constantly"

Interview C:
"I don't have an earthquake bag now. Those days, some municipalities distributed small earthquake bags. There was a torch, a whistler and water in it. Actually such practices are reasonable but I am not sure how beneficial would be a bag with one bottle of water for each house; at last we are not living single in a house. Though we were in such a position that I can say it is better than nothing"

Interview D:

"Earthquake is a matter that should not be forgotten. The sufferings should be remembered so that we are not caught by the next earthquake unprepared. I think earthquake bags are among those things forgotten long ago. Yet, it is another issue to remember the bag while escaping the house in panic at the time of earthquake, but being prepared anyway makes a person feel safe"

Interview E:

"Personally I have nothing but a torch by my bedside. I don't have a bag available. I mean, I couldn't leave the house due to its durability. If I could get out, I think I would have saved myself. It is also hard to remember the bag with the fear"

What do you think about earthquake drill and preparing you home considering the earthquake?

Interview B:

"I wish we knew these practices before the earthquake. Maybe then there would not be so many deaths and injured. It is very logical to determine the escape points because my biggest problem had been leaving the building with my children"

Interview C:

"I think earthquake drill should be performed with the children, so that they learn about this matter and know what to do when they are not with their parents. The place and time of the earthquake are indefinite, so I think it is very important to raise the awareness of our children"

Interview D:

"I am living in earthquake residences built by the government for earthquake victims as my house collapsed during the earthquake. Most of the stuff at home is designed and arranged in compliance with earthquake risk. Therefore I feel myself safer. I

think everyone should allocate a free day for re-arranging their home for earthquake. One day they spent may save their lives"
Are you prepared for a possible earthquake?

Interview E:

"We are experienced as we lived through an earthquake before but we are definitely not prepared. Nobody works on this matter for us to be prepared. If there were actions towards making the society conscious, maybe we could be prepared for the next e-arthquake"

Interview C:

"We are not prepared for the next earthquake. If an earthquake occurs, we may face a greater chaos than the previous one"

Interview A:

"Personally, I have some preparations but I am not sure how much would they protect us. But as a society we are definitely not ready for the next earthquake"

Appendix II: Questions for the Cards of the Game

1ST PART - WHAT IS EARTHQUAKE?

* Right answers

1- Which of the following was the biggest earthquake?
a- May 22, 1960 – Chile *
b- March 11, 2011– Japan
c- August 17, 1999 – Turkey / Golcuk
d- December 26, 2004 – Indonesia

2- Which of the following is not an explanation of an earthquake?
a- It is a natural disaster
b- It destroys the city
c- It involves shaking
d- It is giant sea waves *

3- What is aftershock?
a- People's behavior after earthquake
b- Tsunami
c- A smaller earthquake that follows the main one *
d- A machine that measures an earthquake

4- What is the duration of earthquake?
a- 1-90 seconds *
b- 5 minutes
c- 10 minutes
d- 1 hour

5- How long can an aftershock last?
a- 1 hour
b- There is not a certain time *
c- It will only happen after the earthquake and never repeat again
d- 10 minutes

6- Can we stop an earthquake?
a- Yes
b- No *

7- Can we guess when and where an earthquake will happen?
a- Yes
b- No *

8- An earthquake occurs when a lot of people move at the same time. Yes or No?
a- Yes
b- No*

9- Which answer wouldn’t change the outcome of an earthquake?
a- The magnitude of the earthquake
b- The strength of the buildings
c- Depth of the focus point
d- The number of the rooms in the house *

10- Which of the following is a result of an earthquake:
a-Property Damage
b-Landslide
c-Tsunami
d- All of the above. *

11- Can we guess when an earthquake is going to happen?
a- Yes
b- No *

12- What is a Tsunami?
a- Volcanic earthquake
b- A big fire
c- Giant sea waves*
d- A tornado

13- Is Turkey in an earthquake zone?
a- Yes*
b- No

14- Which does not occur as a result of an earthquake?
a- Roads can get destroyed
b- Lost of phone signal
c- Rainbows*
d- Loss of life and property

15- Which of these can’t change the shape of the Earth?
a- An eclipse*
b- Earthquakes
c- Volcanoes
d- Continent formation movements

16- Which does not affect the severity of an earthquake?
a- Epicenter
b- Climate change *
c- Soil structure
d- The magnitude of the earthquake

17. Which is the biggest danger after an earthquake?
a- Black out
b- Fire *
c- Flood
d- Climate change

18- Which is the science branch that studies earthquake?
a- Seismology *
b- Biology
c- Geology
d-Geomorphology

19- A fault line is the line that makes the earthquake. Is it correct?
a- Yes
b- No *

2ND PART - BEFORE EARTHQUAKE

1- There is a mirror hanging on the wall. How do you secure it?
a- Use a rope and a super glue
b- No need to do anything
c- Use a closed hook to secure to the wall stud and use putty in lower corners *
d- Move it away, who needs a mirror in the living room

2- If there is a smoke alarm in your apartment, how do you ensure that it is working?
a- It is fine, no need to test
b- The person who installed told us that it is working
c- It is hardwired so it must be working
d- We should test the alarm once a month by pressing the test button *

3- When should you turn off the gas?
a- Never
b- After an earthquake and only if you smell gas *
c- After an earthquake, even if there is not a leak
d- Why should I? I will not touch it, it is dangerous

4- What should you do to secure a glass or a ceramic item?
a- We should sell it or put it in the basement so we do not have to worry about it
b- Nothing, they would not hurt anyone
c- We can weight them down with some other stuff, such as water, flower, stone
d- Use a putty or gel *

5- How should you secure a ceiling fan or a lamp?
a- Do nothing, it would not fall
b- Use side lamps instead of ceiling ones
c- Use candles instead of lamps
d- Make sure it is securely attached and reinforced into the ceiling *

6- How do you secure a TV?
a- Use a super glue
b- It is heavy enough, it'll be fine
c- Wrap it with something soft to protect from falling
d- Use TV earthquake straps *

7- Choose an answer that you do not have to consider when you are preparing a classroom from an earthquake.
a- Remove heavy objects from shelves
b- Attach the cabinets and bookcases to the wall
c- Place a TV in the middle of the classroom*
d- Keep the hanging plants in lightweight, unbreakable pots

8- Having a piano must be fun in a classroom. Does a piano cause any problem during an earthquake?
a- Of course not, the piano is too heavy anyway
b- Yes, we should secure it on the ground during an earthquake *
c- It looks cool in the classroom, so we should keep it even though it can be dangerous
d- We do not need a piano in the school

9- Which answer is wrong about preparing your kitchen for an earthquake?
a- Put the cabinets on rubber mats
b- Attach heavy things (refrigerator) to the wall with studs
c- Put the groceries into the cabinets to make the cabinet heavy *
d- Remove the heavy objects from the countertops

10- Which answer will not solve the problem of breaking glasses?
a- Store them in closed cabinets
b- Put them on lower shelves
c- Replace glasses with plexiglass or safety glass
d- Replace glasses with ceramic cups *

11- Which is not important to do before an earthquake?
a- Remove all the heavy or breakable objects from high shelves
b- Attach the tall and heavy furniture to the wall with studs
c- Remove glass containers around the bathtub
d- Remove the curtains*

12- Which part of your body is the most important to protect?
a- Backbone
b- Head and neck *
c- Legs
d- Chest

13- Show drop-cover-hold on
Answer: DROP where you are, onto your hands and knees, COVER your head and neck with one arm and hand, HOLD ON until shaking stops

14- Which is not important to do before an earthquake?
a- Prepare the earthquake emergency kit
b- Set the house in order by the earthquake risk
c- Adopt a pet *
d- Learn first aid information

15- To protect a house with garden from an earthquake which action is a right thing to do?
a- Cut all the trees so that nothing can fall on the house
b- Remove dead or diseased tree limbs *
c- Move to an a1partment, it is safer
d- Have a security camera

16- Are you sure that the fire extinguisher will work when you need to use it?
a- Of course it will work, we never used it before
b- We have to be sure that it has not expired and that we know how to use it *
c- Do we really need it? We are talking about an earthquake, not fire
d- Let’s put in the basement and protect it there until we need it

17- There are many family pictures on the wall. How do we secure those pictures?
a- Use super glue
b- Use a closed hook to secure on the wall *
c- They are fairly small so they would not hurt anyone even if they fall
d-I would just keep my eyes on them, so I can catch them when they fall

18- How do we secure the kitchen cabinets?
a- Use magnetic touch latches *
b- Use glue
c- Paint them
d- They are heavy enough so they will not move

19- Do we need a flashlight in the emergency kit?
a- Yes *
b- No

20- Which is not important to do before an earthquake?
a- Make sure the items on the wall are attached securely
b- Make sure the air conditions are working *
c- Replace the heavy lamps with light ones on the bedside tables
d- Block wheeled objects

21- Which is not important to do before an earthquake?
a- Keep shoes and a flashlight next to each bed
b- Keep your toys and an iPad next to your bed *
c- Keep an emergency whistle next to your bed
d- Get a fire extinguisher for your home

22- During an earthquake, all the energy sources must be shut down. Is it correct?
a- Yes *
b- No

23- Which one is not important to protect yourself from an earthquake?
a- Practice drop, cover and hold on
b- Identify safe spots in every room
c- Learn how to protect yourself
d- Learn another language*

24- Which one you don’t need to do before an earthquake?
a- Plan what to do when an earthquake happens with your family
b- Live in earthquake-resistant buildings
c- Prepare an earthquake emergency kit
d- Replace the old furniture with new ones *

25- Which one would be wrong to do in an earthquake zone?
a- Build multi-story houses
b- Use heavy materials to build houses
c- Do not build houses along the fault lines
d- Build houses on loose grounds *

26- What do you not need to do to protect yourself from an earthquake?
a- Learn the basic skills about first aid
b- Build high-rise buildings on unstable ground *
c- Store water and food supplies for a couple of days
d- Attach the heavy furniture to the wall

27- why should you store water before the earthquake?
a- To wash our clothes
b- To water the flowers
c- To take a shower
d- To survive *

28- Choose an answer that you do have to consider when you are preparing food storage for an earthquake.
a- To store ice-cream, chocolate and cake
b- To store our favorite meals
c- To store energy-providing foods *
d- To store home-made meals

29- Your pets would need your help after an earthquake. Choose an item that you would not need to pack.
a- Leash and water bowl
b- Carrier
c- Enough food and water to survive for 3 days
d- Warm clothes *

30- Choose an item that we do not need for an emergency kit.
a- Battery-powered radio
b- Emergency aid kit
c- Toys *
d- Drinking water

31- Choose an item that we do not need for an emergency kit.
a- Water
b- Energy-providing foods
c- First-aid kit
d- Ruler *

32- Choose an item that we do need for an emergency kit.
a- Some cash *
b- Make up kit
c- iPad
d- World map

33- Choose an item that we do not need for an emergency kit.
a- Whistle
b- Prescription drugs
c- Mirror *
d- One layer of clothing

34- Choose an item that we do not need for an emergency kit.
a- Pen
b- Paper
c- Multipurpose knife
d- Ball *

35- Choose an item that we do need for an emergency kit.
a- Water *
b- Pan
c- Towel
d- Sun glasses

36- Choose an item that we do need for an emergency kit.
a- Skateboard
b- Flashlight *
c- Laptop
d- Hairbrush

3RD PART - DURING & AFTER AN EARTQUAKE

1- A 7.0 magnitude earthquake just happened in your city and a tsunami is coming. What should you do?
a- Get to higher ground not to see the wave *
b- Get to higher ground to get a better view
c- Hide inside of a café next to the sea
d- Stay close to the seaside to get a fresh air

2- An earthquake is happening now, what should you do?
a- Jump out of the window
b- Lie down next to the big sofa and cover your head with your hands *
c- Cry and scream
d- Run outside because it is safer

3- If you are outside when the earthquake happens, what should you do?
a- Run to an open space *
b- Hide under the trees
c- Stay next to the closest wall of building
d- Hide in a car

4- You are outside of your apartment and you feel the aftershock. What should you do?
a- Go back to the inside of the house
b- Stay outside and protect yourself *
c- Run to the bridge
d- Stay next to the electric wires

5- What is the right to do during an earthquake?
a- Wait under the staircase
b- Open the exit door and use the stairs to go outside
c- Wait at home until the earthquake stops *
d- Jump out of the window

6- There is a blackout, after an earthquake occurred. What should you do to see in the dark?
a- Light the candles
b- Turn on a flashlight *
c- Open the window to see some daylight
d- No need to see anything, you can wait until the electricity is back

7- Your mum prepared a dinner with candles on the table. After the dinner, she forgot something before she went to the bed. Which one can cause a problem?
a- She left the dishes in the sink and they will smell so bad
b- She forgot to brush her teeth
c- She left the candles on *
d- She forgot to give a goodnight kiss to her kid

8- You are driving a car while an earthquake occurs. What should you do?
a- Continue driving, as a car is a safe place to be in
b- Stop driving and hide in the car
c- Stop driving, go outside and lie down next to the car *
d- Stop driving, go outside and hide under the car

9- After an earthquake, you managed to go outside. What should you do next?
a- Go to the family meeting spot which you decided previously with your family *
b- Go back inside and look for your family
c- Hide under the closest tree to your house so your parents can find you easily
d- Go back inside and bring the toys with you

10- If you are at school and you feel an earthquake, what should you do to protect yourself?
a- Hide under the table and protect your whole body
b- Look out from the window to see what is happening outside
c- Lie down next to the table and protect your head *
d- Run outside

11- You survived an earthquake while you were at school. But you do not know where your family is. How should you contact them?
a- Send a text message *
b- Borrow someone else's phone because you have no signal
c- Keep calling them
d- Go home by yourself to see if they are ok or not

12- What is a wrong thing to do during an earthquake?
a- Get close to a window *
b- Wait in a small room until the earthquake stops
c- Lie down next to an armchair and protect your head
d-Stay away from the balcony

13- What is a wrong thing to do after an earthquake?
a- Take the emergency kit with you
b- Put an object in front of the door to prevent the door from closing
c- Use the elevator to go downstairs *
d- Turn off the gas

14- What is not a right to do after a tsunami?
a- Stay away from any building near water
b- Go to higher places
c-Watch the tsunami at the port *
d- Take your pets with you

15- If you are in bed at night while an earthquake occurs, what should you do?
a- Roll off from the bed, take a fetal position next to it and cover your head *
b- Stay under your blanket and cover your head
c- Roll off from the bed and hide under it
d- Continue sleeping, the earthquake will stop in a minute

16- If an earthquake happens when you are walking in the hallway, what should you do?
a- Lie down next to a large chair and curl up in a fetal position *
b- Stay near to the doorway
c- Go to the stairs
d- Lean to a bookcase which is not attached to the wall

17- If you are trapped under the debris, what is not a right thing to do?
a- Cover your mouth with clothes
b- Scream until the people can find you *
c- Stay calm and wait for help
d- Hit the wall or the pipes with a strong object so that people can find you

18- The gas started leaking after an earthquake. What is not a right thing to do?
a- Lower your body and get out of the place
b- Play with matches *
c- Cover your face with clothes
d- Do not hide from firefighters

19- What would be the best to do after an earthquake?
a- Leave the house and go to the closest gathering area with your family *
b- Stay at home because the earthquake is over
c- Call all your friends and ask if they are ok or not
d- Go to the beach to have some fresh air

20- What would be wrong to do after an earthquake?
a- Stay away damaged areas
b- Stay out of damaged buildings
c- Use your phone to contact with others *
d- Be careful with chimneys

21- The earthquake is over but there might be an aftershock soon. What is not a right thing to do?
a- Find a safe open area and stay there
b- Keep the streets clear for emergency vehicles and do not drive your car unless there is an emergency
c- Listen to the radio for the information about earthquake
d- Go to a closed/large area to hide *

22- If there is a family member who is in a wheelchair, what shouldn't he/she do?
a- Lock the wheels
b- Protect his/her head and neck
c- Take an elevator to go downstairs *
d- Stay at place during the earthquake

23- Which one is the safest place to be, when there is an earthquake?
a- Bridge
b- Open public park *
c- Underground
d- Seaside

24- Why should you protect your neck and head during earthquake?
a- They are the most fragile parts of the body *
b- The other parts of the body are not as important
c- Physical appearance is important
d- I don't know

25- A short circuit caused a fire. What is not a right thing to do to protect yourself?
a- Open the door where the fire is and try to stop the fire *
b- Close the door without locking it and put wet towels or blankets to avoid the smoke
c- Call rescue center
d- Cover your face with clothes and try to get out

26- If you trapped under debris, what is a dangerous thing to do?
a-Use the whistle
b-Take a deep breath and don't panic
c-Check if you get injured or not
d-Scream *

27- You are at the train station when you start to feel an earthquake. What is not a right thing to do?
a- Do not move until there is an instruction
b- Take care of the kids and the elderly people
c- Do not be panic and listen to the announcements
d- Hide in a train *

28- You are at a super market, and an earthquake happens. What is not a right thing to do?
a- Stay away from the counters and shelves
b- Leave the stuff you just bought and go outside without anything
c- Run to the stairs or the emergency exits to go outside *
d- Listen to the announcement and follow the direction

29- Who should you protect first when the earthquake occurs?
a- Yourself *
b- Grandparents
c- Pets
d- Babies

30- What is not a right thing to do if you are in the metro during an earthquake?
a- Listen and do what the train conductors tell you
b- Wait next to the columns and protect your head
c- Run to the outside as soon as the metro stops *
d- Electricity might be gone for a while so don't be panic

31-When the earthquake occurred you were at a stadium. What is not the right thing to do?
a- Go to the middle part of the stadium
b- Listen to the announcement and follow the direction
c- Try to take a picture with the football players *
d- Stop being panic

Appendix III: Design Varitions for the board

Appendix IV: Packaging Design Variations


NEXT
HERO
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EARTHQUAKE SURVIVAL QUIZ

Appendix V: Informations Used in the Earthquake Preparedness Booklet for Be The Next Hero game

Earthquake Preparedness in Turkey

Turkey is a country that 90% of its territory faces the risk of earthquakes and deals with a lot of problems as a result of earthquakes. Through proper measures taken, risks of earthquake in Turkey can be lessened. As mentioned in disaster management, measures to be taken are discussed under three main headings. If the preparation of pre-earthquake, earthquake, and post-earthquake phases are correctly performed, the risk of damage from a potential earthquake may be lower and the number of life and property losses to be minimal. Accordingly, it is very important for individuals to prepare themselves and their families for the earthquake before it happens. For this purpose, by preparing precautionary measures, "DASK" (Natural Disaster Insurances Authority) and "AFAD" (Disaster and Emergency Management Agency) organizations help the public in reducing the emotional and material damages caused by the earthquake (cf. AFAD 2018, online).

- **Before an Earthquake**

The precautions that individuals should take before the earthquake can be considered as the most important phase of earthquake preparation work. The purpose of this would be that individuals should not be caught unprepared in the event of a possible earthquake, and that the loss of damage after the earthquake will be reduced to a minimum. Pre-earthquake preparedness work includes; assessment and planning of risks, arrangement of the place of living according to a possible earthquake and preparation of emergency necessities (cf. DASK 2018, online).

Risk Analysis and Planning

It is very important to evaluate the risks and to take necessary precautions in preparation for the earthquake. First of all, a family meeting with the participation of all the parents including the children in the school age should be organized, the preparations before the earthquake as well as things to do during earthquake and afterwards should be discussed. In the event of a possible earthquake, places that could present danger should be determined in advance so that the risk of being in a difficult situation in the event of an earthquake can be minimized (cf. DASK 2018, online).

Another important issue that needs to be discussed during planning before the earthquake is the meeting points. The reason for this is the possibility that not all family members will be together when there is an earthquake. Family members should identify meeting

points that everyone can easily find and come together after the earthquake (cf. DASK 2018, online).

It is difficult to use the phones due to the congestion of the lines after the earthquake. Phones that need to be used in health emergencies are at risk of being overwhelmed by congestion inflicted by the public's use of personal phones. For this reason, communication after the earthquake will certainly be difficult. The solution is to use the text message feature of mobile phones as a solution rather than calling to communicate and notify your situation. This way of communicating should be shared with family members and implemented after the earthquake (cf. DASK 2018, online).

It is impossible to say for any building that it is earthquake-resistant. However, properly built buildings according to earthquake specifications can save the life of the inhabitants by reducing the risks. For this reason, it is very important to pay attention to this criterion on when choosing housing. If the building is considered unsafe for earthquake, individuals may apply to local government agencies or universities for a survey of the building (cf. DASK 2018, online).

After the earthquake, it is necessary for individuals to identify necessary survival documents and to keep copies of these documents in a waterproof sack and put them in "earthquake bags" with the possibility that there will be damages that wo; prevent hem to return back to their homes. Documents such as titles to their homes, national ID card, bank books, school diplomas and passport can be given as examples of papers that should be copied (cf. DASK 2018, online).

In addition to all these, having the possibility of an earthquake at night, keeping an emergency flashlight, shoes or sturdy slippers next to the bed will help the person to find his/her way out and protect his/her feet. Once in a while, testing to gain access to this material easily in a dark room will allow individuals to gain practicality (cf. DASK 2018, online).

Arranging Living Quarters According to Earthquake

It is known that about half of the damages, casualties and injuries in the earthquake are due to non-structural elements. Lighting, ventilation, heating systems, furniture and other components, for example, fall into this group of non-structural elements. Precautions must be taken to prevent falling objects from the cabinets or furniture that are likely to topple over to block the exit routes. Securing furniture and taking the non-securable ones out of the way are among the measures to include in this list (cf. DASK 2018, online). On the precautionary list prepared by AFAD;

- The items placed on top of the cabinet must be secured with plastic holding materials or adhesives to prevent them from falling

- Stoves and heaters should be secured to the wall or floor with sturdy materials
- Locks on cabinet doors with heavy items in them must be used to keep them tightly closed
- An elastic tape or wire can be added in front of the shelves. Small objects and bottles should be placed in boxes so that they do not hit each other
- Gas valves and electrical fuses must be automated to counteract to any gas leaks and fire risks
- Use outward-facing doors and emergency exit doors should not be locked. Emergency exits must be illuminated by creating large escape routes. Also anything that can blocks the exits must be removed from the exit routes
- The beds should not be placed next to a window or heavy cabinets that are at risk of toppling over, and there should be no shelves with heavy items on them above the beds
- There should be a fire extinguisher in a place where everyone can reach in case there is fire in the building (cf. AFAD 2018, online).

Preparation of Emergency Needs

In addition, during the earthquake, alternative water should be stored against the possibility of breakage of water pipes both in the streets and in the buildings. It is recommended to store four liters of water per person per day and store them in glass bottles in a safe and dark place. In addition to water, foods that will last a long time should be selected when storing food (cf. DASK 2018, online).

The greatest risk after the earthquake is the fire. For this reason, the gas valves should be closed against the risk of gas leaks, and after the earthquake, without checking for any gas leaks, matches etc. should not be used. When the electricity comes back after a power outage may cause excessive energy load, so the plugs of electrical appliances should not be left in the outlets. For similar reasons, it is necessary to close the water valves if the water pipes are damaged (cf. DASK 2018, online).
For the things to be used in an emergency, a storage area inside or outside the house in which they are not exposed to water and air should be established. These materials need to be checked for best by dates and replaced if necessary. It is also very important to have a set of necessary materials in order to survive after the earthquake. Preparing bags for these items and storing them at home, in cars and at work provides great help if the problems arise after the earthquake. These items should be found in earthquake bags:

- Water
- Energy-providing foods
- Flashlight with spare battery
- Radio with spare battery
- First-aid kit
- Prescription drugs

- One layer of clothing
- Some cash
- Multipurpose knife
- Whistle
- Pen, paper
- A waterproof folder containing important phone numbers and information
- Special items for children, elderly people, people with disabilities and pets trash bags for toilet paper and toilet wastes.

In earthquake bags prepared for the students in the school;

- Information about students' families
- Family photo
- Food
- A bottle of water.

Each school should have an Emergency Management System and schools should keep more than enough materials. In addition, these bags should be kept in easy-to-reach places, the contents should be checked every six months and the damaged and shrunken items should be replaced (cf. DASK 2018, online).

- **During an Earthquake**

Due to the fact that everything happens quickly during an earthquake, there is no time to think about what to do. Therefore, it is very important to carry out drills until it becomes a natural reaction during the earthquake. The implementation and evaluation of these drills at home, at school and at work is necessary to reduce the damages of an earthquake. During the earthquake a sound is heard first, followed by a tremor. For this reason, it is necessary to warn others by shouting "EARTHQUAKE!" without panicing when the earthquake starts (cf. DASK 2018, online).

Indoor Safety

If in a building when the earthquake happens, a safe place should be found and "DROP-COVER-HOLD ON" must be applied, that is, the individual must get down on their knees and cover their neck and head and hold on to something so they won't fall over (cf. AFAD 2018, online).

Also note the cautionary list AFAD and DASK have published;

- Stay away from stationary cabinetry, shelves, windows, etc. type of furniture
- The head should be placed between two hands or protected with a pillow and stay that way until the Tremors go away

- Should not run to the stairwells, should stay in a safe place until the earthquake is over
- The elevator must not be used
- The bottom of the stairs or the door beams should not be used for hiding
- Should not step out to the balcony or jump from balconies or windows
- If a wheelchair is used, the wheels must be locked and the head and neck must be protected
- Matches or lighters should not be used, electric outlets should not be touched
- The individual must stay in the bathroom until the end of the earthquake and stay away from mirrors or goods that can fall down, since smaller spaces are safer, such as bathrooms, one should stay in there until the tremors are gone
- Since the ground floor is the most dangerous area people should stay in the upper floors until the earthquake is over
- In Schools, it is necessary to lie next to the desks rather than under so one rules out the risk of being crushed under them
- If the earthquake happens while sleeping, one should slide to the side of the bed and lay there protecting head and neck
- After the shock, electric, gas and water valves should be closed and the stove and heaters should be turned off
- After the earthquake building should be carefully exited on the pre-determined path to the meeting area
- the phone should not be used except in emergencies (cf. DASK; AFAD 2018, online).

Outdoor Safety

Since it is not clear when and where an earthquake can occur, it is highly probable that people will be outside when that happens. In the case of an earthquake hapening in an open area, the things to be done are listed as below. Individuals should;

- Go to open and wide areas, protect themselves from rubbles, electrical cables and trees
- Not walk alongside the walls
- Stay away from the seashores, bridges and underpasses
- Pay attention to broken, potentially falling billboards
- Be careful about the dangers that might come from sewage, electricity and gas lines (cf. Afad 2018, online).

If the vehicle is being used at the time of an earthquake, the vehicle must be stopped and individual should get off the vehicle, lay down next to it with legs curled up towards the stomach, and the head and neck protected. Waiting inside the car during the tremor is dangerous due to the fact that there are possibilities of large debris falling on to the car. The loss of lives crushed in cars due to falling debris is very common (cf. DASK 2018, online)

In some cases, inside of buildings could be safer from the outside, so individuals who are caught outside should be more careful. For example;

If earthquake happens while in a market or store:

- Should stay away from large columns, shelves and cabinets
- Should not run to the fire escapes, stairs and escalators
- Should listen to announcements and follow the warnings and suggestions from store security personnel
- Should exit the store empty handed, leaving the goods purchased behind (cf. Mega inşaat ve mimarlık, online).

If the earthquake happens in tall structures:

- The upper floors should be more careful as they shake more than the lower floors
- Protect the head with things like bags, mattresses, books
- If in an elevator, should get off at the first floor it stops
- Stay away from things like cabinets (cf. AFAD 2018, online).

If the earthquake occurs while in a theater or cinema:

- During the movie, the hall would be dark therefore individuals
- Should move by listening to the security officers and authorities without panicking
- Should crouch between rows and protect their heads with a bag
- Should not stay under a large lighting equipment if there is one
- Should not run towards the fire exit immediately (cf. Mega inşaat ve mimarlık, online).

If the earthquake happens ın underground market or crossings:

- If there are no fires, gas leaks and flooding, individuals should wait there and not panic if the electricity is cut off
- Should stay away from windows
- Should protect themselves from falling objects
- Should not immediately try to exit by running to the stairs
- If there is a fire, they should close their mouth with a tissue and leave the place by squatting and walking by the walls (cf. Mega inşaat ve mimarlık, online).

If the earthquake occurs in a train station:

- Should listen to the station manager’s announcements without panicking
- Should pay attention and take care of the children and the elderly
- Should act in accordance with the instructions of the authorities and not act suddenly on their own decision (cf. AFAD 2018, online).

If the the earthquake happens while on the subway or public transportation:

- Should not exit the train due to electrified rails or the possibility of getting hit by another train

- Should wait until the end of the tremors by holding to something securely on the train
- Should not panic in the darkness after a power failure
- Should protect the head against the possibility of falling items stored on the shelves
- Should listen to the train conductor's announcement
- If the trmors happen before getting on board, individuals should stand next to the columns and paying attention to falling objects (cf. AFAD 2018, online).

If the earthquake occurs in a stadium:

- Should stay calm and not scare from the panic on the bleachers
- Should go to the middle of the field quietly as that would be the most secure area in the stadium
- Should listen to the announcements and do what is told (cf. Mega inşaat ve mimarlık, online).

If the earthquake occurs near the sea:

- Due to the danger of tsunami, individuals should immediately get to the higrher grounds
- Should wait at the high ground keeping in mind that the second wave will be stronger than the first one
- Should act without panicking by listening to the tsunami news available via radio or tv
- Should not enter buildings near the water as tsunami can destroy those building (cf. AFAD 2018, online).

After an Earthquake

Staying calm without panicking helps minimize the damage that may occur after an e-arthquake. The individual must first be sure of his/her safety and then check to see if there is anyone around they can help. If there is no imminent danger, it is necessary not to move anyone and should bring help to the scene (cf. DASK 2018, online).

An individual who is in a closed area after the termors are gone;

- Should clean fallen dangerous obejcts
- Should pay attention to broken glass
- Should check gas, water and electrical equipment and shut them off if damaged
- Should not use matches or lighters if there is a smell of gas and leave the building after opening windows and doors
- Should not use the phone except in emergencies
- Should listen to the radio to find out what's going on
- Should go to the previously identified neighborhood gathering point with their emergency bag (cf. AFAD 2018, online).

After a big earthquake, due to aftershocks, individuals should not return back to their houses right away. The reason for this is the possibility of aftershocks causing further damages to already damaged buildings. What should be done during an earthquake should also be followed during the aftershocks and the buildings should not be entered until all the tremors are fully gone (cf. AFAD 2018, online).

After an earthquake, an individual in an open space should know what to do. Individual;
Should carefully take notes of the damages to their surrounding
Should stay away from damaged premises and electric lines
Should aid those in need of emergency in the immediate vicinity
Should then go to the neighborhood gathering point (cf. DASK 2018, online)

If the individual is covered under debris;

- Should check their situation without panicking
- If the mobility is limited, should wait for help patiently
- Should not constantly shout to avoid the problems of losing their energy or their voice by clogging their respiratory tract with dust and smoke,
- Should respond to voices coming from outside
- Should make sounds by hitting concrete blocks or heating pipes with a hard object they find from their surroundings (cf. AFAD 2018, online)

All these materials and explanations are of great importance in order to survive an e-arthquake with the least damages. Without the need for special skills, earthquake victims can protect themselves in many ways and help others. If necessary measures are taken against the earthquake, it is possible to reduce the loss of life and property.

Appendix VI: Financial Calculations – TL

		Unit	Month 1 Week 1	Week 2	Week 3	Week 4	Month 2 Week 1	Week 2	Week 3	Week 4	Month 3 Week 1	Week 2	Week 3	Week 4	Month 4 Total	Month 5 Total	Month 6 Total	Month 7 Total	Month 8 Total	Month 9 Total	Month 10 Total	Month 11 Total	Month 12 Total	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Year 5 Total
1	Sales Prices																											
	by Channe																											
1.1.	School	TL	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	96.0	115.2	138.2	165.9
1.2.	Public Areas	TL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	130.0	169.0	219.7	285.6
1.3.	Other	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	TL	-	-	94.3	93.3	92.0	92.3	91.8	92.0	92.0	92.0	93.0	92.5	92.7	95.8	97.6	98.2	98.4	98.7	98.9	98.4	98.2	96.5	124.4	160.8	208.1	269.7
2	Sales Volumes																											
	by Channe																											
2.1.	School	piece(s)	-	-	2.0	3.0	4.0	5.0	7.0	8.0	10.0	8.0	8.0	12.0	40.0	20.0	10.0	8.0	7.0	6.0	5.0	8.0	10.0	181.0	217.0	260.0	312.0	374.0
2.2.	Public Areas	piece(s)	-	-	5.0	6.0	6.0	8.0	10.0	12.0	15.0	12.0	15.0	20.0	70.0	75.0	75.0	80.0	80.0	85.0	90.0	90.0	100.0	854.0	1,110.0	1,443.0	1,875.0	2,437.0
2.3.	Other	piece(s)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	piece(s)	-	-	7.0	9.0	10.0	13.0	17.0	20.0	25.0	20.0	23.0	32.0	110.0	95.0	85.0	88.0	87.0	91.0	95.0	98.0	110.0	1,035.0	1,327.0	1,703.0	2,187.0	2,811.0
3	Sales Revenues																											
	by Channe																											
3.1.	School	TL	-	-	160	240	320	400	560	640	800	640	640	960	3,200	1,600	800	640	560	480	400	640	800	14,480	20,832	29,952	43,131	62,042
3.2.	Public Areas	TL	-	-	500	600	600	800	1,000	1,200	1,500	1,200	1,500	2,000	7,000	7,500	7,500	8,000	8,000	8,500	9,000	9,000	10,000	85,400	144,300	243,867	411,938	696,032
3.3.	Other	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	TL	-	-	660	840	920	1,200	1,560	1,840	2,300	1,840	2,140	2,960	10,200	9,100	8,300	8,640	8,560	8,980	9,400	9,640	10,800	99,880	165,132	273,819	455,068	758,074
4	Cost of Unit Piece																											
	by Channe																											
4.1.	School	TL	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0		60.0	72.0	86.4	103.7
4.2.	Public Areas	TL	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0		60.0	72.0	86.4	103.7
4.3.	Other	TL	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0		60.0	72.0	86.4	103.7
5	Cost of Sales																											
	by Channe																											
5.1.	School	TL	-	-	100	150	200	250	350	400	500	400	400	600	2,000	1,000	500	400	350	300	250	400	500	9,050	13,020	18,720	26,957	38,776
5.2.	Public Areas	TL	-	-	250	300	300	400	500	600	750	600	750	1,000	3,500	3,750	3,750	4,000	4,000	4,250	4,500	4,500	5,000	42,700	66,600	103,896	162,000	252,668
5.3.	Other	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	TL	-	-	350	450	500	650	850	1,000	1,250	1,000	1,150	1,600	5,500	4,750	4,250	4,400	4,350	4,550	4,750	4,900	5,500	51,750	79,620	122,616	188,957	291,444
6	Gross Profit																											
	by Channe																											
6.1.	School	TL	-	-	60	90	120	150	210	240	300	240	240	360	1,200	600	300	240	210	180	150	240	300	5,430	7,812	11,232	16,174	23,266
6.2.	Public Areas	TL	-	-	250	300	300	400	500	600	750	600	750	1,000	3,500	3,750	3,750	4,000	4,000	4,250	4,500	4,500	5,000	42,700	77,700	139,971	249,938	443,363
6.3.	Other	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	TL	-	-	310	390	420	550	710	840	1,050	840	990	1,360	4,700	4,350	4,050	4,240	4,210	4,430	4,650	4,740	5,300	48,130	85,512	151,203	266,112	466,629
7	Operational Expense																											
	by Nature and Channe																											
7.1.	Launch Meetings	TL																										
7.1.1.	School	TL	24	240	240	240	240	240	-	-	-	-	120	-	-	-		120	-	-	-	120	-	1,584	-	-	-	-
7.1.2.	Public Areas	TL	870	870	870	870	870	870	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,220	-	-	-	-
7.1.3.	Other	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub-Total	TL	894	1,110	1,110	1,110	1,110	1,110	-	-	-	-	120	-	-	-	-	120	-	-	-	120	-	6,804	-	-	-	-
7.2.	Travel	TL																										
7.2.1.	School	TL	100	100	100	100	100	100	100	100	100	100	100	100	400	400	400	400	400	400	400	400	400	4,800	5,760	6,912	8,294	9,953
7.2.2.	Public Areas	TL	80	80	80	80	80	80	80	80	80	80	80	80	320	320	320	320	320	320	320	320	320	3,840	4,608	5,530	6,636	7,963
7.2.3.	Other	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub-Total	TL	180	180	180	180	180	180	180	180	180	180	180	180	720	720	720	720	720	720	720	720	720	8,640	10,368	12,442	14,930	17,916
7.3.	Food	TL																										
7.3.1.	School	TL	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	160	3,360	4,032	4,838	5,806	6,967
7.3.2.	Public Areas	TL	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	2,520	3,024	3,629	4,355	5,225
7.3.3.	Other	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub-Total	TL	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	280	5,880	7,056	8,467	10,161	12,193
7.4.	Other - 1	TL																										
7.4.1.	School	TL	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	1,050	1,260	1,512	1,814	2,177
7.4.2.	Public Areas	TL	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	1,050	1,260	1,512	1,814	2,177
7.4.3.	Other	TL	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	630	756	907	1,089	1,306
	Sub-Total	TL	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	2,730	3,276	3,931	4,717	5,661
7.5.	Other - 2	TL																										
7.5.1.	School	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5.2.	Public Areas	TL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5.3.	Other	TL	160	160	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	960	1,152	1,382	1,659	1,991
	Sub-Total	TL	160	160	160	160	160	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	960	1,152	1,382	1,659	1,991
7.6.	Total																											
7.6.1.	School	TL	334	550	550	550	550	550	310	310	310	310	430	310	610	610	610	730	610	610	610	730	610	10,794	11,052	13,262	15,915	19,098
7.6.2.	Public Areas	TL	1,120	1,120	1,120	1,120	1,120	1,120	250	250	250	250	250	250	490	490	490	490	490	490	490	490	490	12,630	8,892	10,670	12,804	15,365
7.6.3.	Other	TL	190	190	190	190	190	190	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	1,590	1,908	2,290	2,748	3,297
	Total	TL	1,644	1,860	1,860	1,860	1,860	1,860	590	590	590	590	710	590	1,130	1,130	1,130	1,250	1,130	1,130	1,130	1,250	1,130	25,014	21,852	26,222	31,467	37,760
8.	Operating Profi																											
8.1.	School	TL	(334)	(550)	(490)	(460)	(430)	(400)	(100)	(70)	(10)	(70)	(190)	50	590	(10)	(310)	(490)	(400)	(430)	(460)	(490)	(310)	(5,364)	(3,240)	(2,030)	259	4,168
8.2.	Public Areas	TL	(1,120)	(1,120)	(870)	(820)	(820)	(720)	250	350	500	350	500	750	3,010	3,260	3,260	3,510	3,510	3,760	4,010	4,010	4,510	30,070	68,808	129,301	237,133	427,998
8.3.	Other	TL	(190)	(190)	(190)	(190)	(190)	(190)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(1,590)	(1,908)	(2,290)	(2,748)	(3,297)
	Total	TL	(1,644)	(1,860)	(1,550)	(1,470)	(1,440)	(1,310)	120	250	460	250	280	770	3,570	3,220	2,920	2,990	3,080	3,300	3,520	3,490	4,170	23,116	63,660	124,981	234,645	428,869

Increase in (%)

Sales Prices

Year 2	Year 3	Year 4	Year 5
20.0%	20.0%	20.0%	20.0%
30.0%	30.0%	30.0%	30.0%
30.0%	30.0%	30.0%	30.0%

Sales Volumes

Year 2	Year 3	Year 4	Year 5
20.0%	20.0%	20.0%	20.0%
30.0%	30.0%	30.0%	30.0%
30.0%	30.0%	30.0%	30.0%

Unit Piece Cost

Year 2	Year 3	Year 4	Year 5
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%

Travel

Year 2	Year 3	Year 4	Year 5
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%

Food

Year 2	Year 3	Year 4	Year 5
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%

Other - 1

Year 2	Year 3	Year 4	Year 5
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%

Other - 2

Year 2	Year 3	Year 4	Year 5
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%
20.0%	20.0%	20.0%	20.0%

Appendix VII: Financial Calculations – Converted to Euro

		EUR / TL	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	4.860	5.185	5.531	5.901	6.296
		Unit	Month 1 Week 1	Week 2	Week 3	Week 4	Month 2 Week 1	Week 2	Week 3	Week 4	Month 3 Week 1	Week 2	Week 3	Week 4	Month 4 Total	Month 5 Total	Month 6 Total	Month 7 Total	Month 8 Total	Month 9 Total	Month 10 Total	Month 11 Total	Month 12 Total	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Year 5 Total
1	Sales Prices by Channe																										
1.1.	School	EUR	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	18.5	20.8	23.4	26.3
1.2.	Public Areas	EUR	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	25.1	30.6	37.2	45.4
1.3.	Other	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	EUR	-	-	19.4	19.2	18.9	19.0	18.9	18.9	18.9	18.9	19.1	19.0	19.1	19.7	20.1	20.2	20.2	20.3	20.4	20.2	20.2	19.9	24.0	29.1	35.3	42.8
2	Sales Volumes by Channe																										
2.1.	School	piece(s)	-	-	2.0	3.0	4.0	5.0	7.0	8.0	10.0	8.0	8.0	12.0	40.0	20.0	10.0	8.0	7.0	6.0	5.0	8.0	10.0	181.0	217.0	260.0	312.0	374.0
2.2.	Public Areas	piece(s)	-	-	5.0	6.0	6.0	8.0	10.0	12.0	15.0	12.0	15.0	20.0	70.0	75.0	75.0	80.0	80.0	85.0	90.0	90.0	100.0	854.0	1,110.0	1,443.0	1,875.0	2,437.0
2.3.	Other	piece(s)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	piece(s)	-	-	7.0	9.0	10.0	13.0	17.0	20.0	25.0	20.0	23.0	32.0	110.0	95.0	85.0	88.0	87.0	91.0	95.0	98.0	110.0	1,035.0	1,327.0	1,703.0	2,187.0	2,811.0
3	Sales Revenues by Channe																										
3.1.	School	EUR	-	-	33	49	66	82	115	132	165	132	132	198	658	329	165	132	115	99	82	132	165	2,980	4,018	5,415	7,309	9,855
3.2.	Public Areas	EUR	-	-	103	123	123	165	206	247	309	247	309	412	1,440	1,543	1,543	1,646	1,646	1,749	1,852	1,852	2,058	17,572	27,832	44,088	69,806	110,557
3.3.	Other	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	EUR	-	-	136	173	189	247	321	379	473	379	440	609	2,099	1,872	1,708	1,778	1,761	1,848	1,934	1,984	2,222	20,552	31,849	49,503	77,115	120,412
4	Cost of Unit Piece by Channe																										
4.1.	School	EUR	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3		11.6	13.0	14.6	16.5
4.2.	Public Areas	EUR	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3		11.6	13.0	14.6	16.5
4.3.	Other	EUR	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3		11.6	13.0	14.6	16.5
5	Cost of Sales by Channe																										
5.1.	School	EUR	-	-	21	31	41	51	72	82	103	82	82	123	412	206	103	82	72	62	51	82	103	1,862	2,511	3,384	4,568	6,159
5.2.	Public Areas	EUR	-	-	51	62	62	82	103	123	154	123	154	206	720	772	772	823	823	875	926	926	1,029	8,786	12,845	18,783	27,452	40,134
5.3.	Other	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	EUR	-	-	72	93	103	134	175	206	257	206	237	329	1,132	977	875	905	895	936	977	1,008	1,132	10,648	15,357	22,167	32,020	46,293
6	Gross Profit by Channe																										
6.1.	School	EUR	-	-	12	19	25	31	43	49	62	49	49	74	247	123	62	49	43	37	31	49	62	1,117	1,507	2,031	2,741	3,696
6.2.	Public Areas	EUR	-	-	51	62	62	82	103	123	154	123	154	206	720	772	772	823	823	875	926	926	1,029	8,786	14,986	25,305	42,354	70,423
6.3.	Other	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	EUR	-	-	64	80	86	113	146	173	216	173	204	280	967	895	833	872	866	912	957	975	1,091	9,904	16,493	27,335	45,095	74,119
7	Operational Expenses by Nature and Channe																										
7.1.	Launch Meetings	EUR																									
7.1.1.	School	EUR	5	49	49	49	49	49	-	-	-	-	25	-	-	-	-	25	-	-	-	25	-	326	-	-	-	-
7.1.2.	Public Areas	EUR	179	179	179	179	179	179	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,074	-	-	-	-
7.1.3.	Other	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub-Total	EUR	184	228	228	228	228	228	-	-	-	-	25	-	-	-	-	25	-	-	-	25	-	1,400	-	-	-	-
7.2.	Travel	EUR																									
7.2.1.	School	EUR	21	21	21	21	21	21	21	21	21	21	21	21	82	82	82	82	82	82	82	82	82	988	1,111	1,250	1,406	1,581
7.2.2.	Public Areas	EUR	16	16	16	16	16	16	16	16	16	16	16	16	66	66	66	66	66	66	66	66	66	790	889	1,000	1,124	1,265
7.2.3.	Other	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub-Total	EUR	37	37	37	37	37	37	37	37	37	37	37	37	148	148	148	148	148	148	148	148	148	1,778	2,000	2,249	2,530	2,846
7.3.	Food	EUR																									
7.3.1.	School	EUR	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	691	778	875	984	1,107
7.3.2.	Public Areas	EUR	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	519	583	656	738	830
7.3.3.	Other	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sub-Total	EUR	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	58	1,210	1,361	1,531	1,722	1,937
7.4.	Other - 1	EUR																									
7.4.1.	School	EUR	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	216	243	273	307	346
7.4.2.	Public Areas	EUR	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	216	243	273	307	346
7.4.3.	Other	EUR	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	130	146	164	184	208
	Sub-Total	EUR	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	562	632	711	799	899
7.5.	Other - 2	EUR																									
7.5.1.	School	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5.2.	Public Areas	EUR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.5.3.	Other	EUR	33	33	33	33	33	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	198	222	250	281	316
	Sub-Total	EUR	33	33	33	33	33	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	198	222	250	281	316
7.6.	Total																										
7.6.1.	School	EUR	69	113	113	113	113	113	64	64	64	64	88	64	126	126	126	150	126	126	126	150	126	2,221	2,132	2,398	2,697	3,033
7.6.2.	Public Areas	EUR	230	230	230	230	230	230	51	51	51	51	51	51	101	101	101	101	101	101	101	101	101	2,599	1,715	1,929	2,170	2,441
7.6.3.	Other	EUR	39	39	39	39	39	39	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	327	368	414	466	524
	Total	EUR	338	383	383	383	383	383	121	121	121	121	146	121	233	233	233	257	233	233	233	257	233	5,147	4,215	4,741	5,332	5,998
8.	Operating Profit																										
8.1.	School	EUR	(69)	(113)	(101)	(95)	(88)	(82)	(21)	(14)	(2)	(14)	(39)	10	121	(2)	(64)	(101)	(82)	(88)	(95)	(101)	(64)	(1,104)	(625)	(367)	44	662
8.2.	Public Areas	EUR	(230)	(230)	(179)	(169)	(169)	(148)	51	72	103	72	103	154	619	671	671	722	722	774	825	825	928	6,187	13,271	23,376	40,184	67,983
8.3.	Other	EUR	(39)	(39)	(39)	(39)	(39)	(39)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(327)	(368)	(414)	(466)	(524)
	Total	EUR	(338)	(383)	(319)	(302)	(296)	(270)	25	51	95	51	58	158	735	663	601	615	634	679	724	718	858	4,757	12,278	22,595	39,762	68,121

Eidesstattliche Erklärung

Ich versichere an Eides statt,

- dass ich die Masterarbeit selbständig verfasst, keine anderen als die angegebenen Quellen und Hilfsmittel verwendet und mich auch sonst keiner unerlaubten Hilfe bedient habe;
- dass ich alle wörtlich oder sinngemäß übernommenen Stellen in der Arbeit gekennzeichnet habe;
- dass ich dieses Masterarbeitsthema bisher weder im In- noch im Ausland in irgendeiner Form als Prüfungsarbeit vorgelegt habe;
- dass diese Arbeit mit der vom Begutachter beurteilten Arbeit übereinstimmt.

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Ort, Datum, Unterschrift