

Natural Disaster Literacy Curriculum Proposal

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Abstract

Problems related to natural disasters in Turkey and the world are increasing every day. It seems that the main source of these problems is the inadequacies in natural disaster training. The main starting point of the study is that acquisitions about natural disasters in all the curricula in Turkey do not contribute to the natural disaster literacy in terms of quality and quantity. For this reason, a natural disaster literacy course curriculum has been proposed for high schools. In the study, the basic philosophy and general objectives of the natural disaster literacy course curriculum have been defined. In the curriculum, the acquisitions that are convenient to the dimensions of natural disaster literacy (knowledge-attitude-behavior); skills and values related to those acquisitions and units have also been included. The natural disaster literacy course, which has been planned to be 2 course hours per week at the level of 9th grade, consists of 5 units and 49 acquisitions. It is recommended that the study to be examined and applied in the form of a sample curriculum. Thus, students are expected to be natural disaster literate. It is thought that the increase in the number of individuals who are natural disaster literate will decrease the material and immaterial damages caused by natural disasters.

Keywords: Natural disasters, Curriculum, Literacy, Acquisition

Doğal Afet Okuryazarlığı Dersi Öğretim Programı Önerisi

Özet

Türkiye’de ve Dünya’da doğal afet kaynaklı sorunlar her geçen gün artmaktadır. Bu sorunların temel kaynağı doğal afet eğitimindeki yetersizlikler olarak görülmektedir. Çalışmanın ana gerekçesi Türkiye’de tüm öğretim programlarındaki doğal afetlerle ilgili kazanımların nitelik ve nicelik olarak doğal afet okuryazarlığına katkı sağlamamasıdır. Bu gerekçe doğrultusunda liseler için bir doğal afet okuryazarlığı dersi öğretim programı önerisi getirilmiştir. Çalışmada doğal afet okuryazarlığı dersi öğretim programının temel felsefesi ve genel amaçları açıklanmıştır. Öğretim programında doğal afet okuryazarlığı boyutlarına (bilgi-tutum-davranış) uygun olan kazanımlar; bu kazanımlarla ve üniteler ile ilintili beceri ve değerlere de yer verilmiştir. 9. sınıf düzeyinde haftada 2 ders saati olarak düşünülen doğal afet okuryazarlığı dersi 5 ünite ve 49 kazanımdan oluşmaktadır. Çalışmanın örnek bir öğretim programı şeklinde incelemek uygulamaya konulması önerilmektedir. Bu sayede öğrencilerin doğal afet okuryazarı olması beklenmektedir. Doğal afet okuryazarı birey sayısının artması ile doğal afet kaynaklı maddi ve manevi zararların azalacağı düşünülmektedir.

Anahtar Kelimeler: Doğal afet, Müfredat, Okuryazarlık, Kazanım

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1. INTRODUCTION

The curriculum is a program that aims to gain specific categories of knowledge, attitudes and skills in accordance with the objectives of the educational program (Küçükahmet, 2009). The first and important condition in the preparation of a curriculum is the presence of a need. The development of curricula should be carried out with a student-oriented program design in line with the needs of the society. Curricula that do not meet the requirements of the age lose their importance over time or the development of new curricula in line with the needs of the age comes to the fore. In other words, curricula prepared according to the needs and realities of the age will make a significant contribution to the society.

In this study, natural disaster literacy curriculum model has been proposed. First of all, although there are different types of disasters (natural-human-extraterrestrial), the impact of natural disasters among them is enormous. Furthermore, it is known that disasters of natural origins play a role in the occurrence of human originated ones. The most important factor in the proposal of this curriculum is that the frequency of natural disasters in Turkey have been increasing recently. Human beings have basically no effect on the occurrence of natural disasters. However, efforts to minimize the hazards caused by natural disasters and preparations for disasters can be done consciously. Therefore, natural disaster training should be provided. As Sözcü (2019a) stated, natural disaster literacy is closely related to the education level of the people of a country. If natural disaster literacy does not improve, many economic, social and psychological problems may arise during and after a disaster.

The most remarkable problem is the loss of trained human resources due to natural disasters. In this regard, raising the youth of countries as natural disaster literate will minimize the problems likely to be experienced.

In this context, natural disaster literacy will enable the individual as a citizen to understand a natural disaster problem in detail, to be able to apply the stages of analysis, synthesis and evaluation, and eventually to make healthy and conscious decisions.

When the literature is examined, there are various reasons for the need for a natural disaster literacy course. In his Ph.D. research, Sözcü (2019a) defined the natural disaster literacy levels of prospective teachers through scales he developed. The results of the research concluded that the natural disaster literacy levels of prospective teachers, who are the teachers of the future, are not sufficient. Sözcü and Aydınöz (2019) examined the acquisitions of the courses at all education levels and found if they are directly or indirectly related to natural disasters. They examined the relationship between these acquisitions and the dimensions of natural disaster literacy. As a result of the study, it was found that the acquisitions related to natural disasters at all levels of education were insufficient and did not adequately serve the dimensions of natural disaster literacy. Disasters and disaster management courses have been added to the program in the last semester of geography and social studies teaching departments with the new undergraduate programs. There should be a course through which the prospective teachers who receive this training, can share the outcomes of this training in formal education. In 2005, with the fundamental changes made in the programs of all educational levels, secondary school programs included the sub-discipline of disaster prevention and safe living. Although the number and quality of the acquisitions related to natural disasters seem to have improved relatively thanks to the sub-disciplines, the fact that the acquisitions are not considered in the context of information size-weighted intensity and natural disaster literacy, is seen as a deficiency. Above all these negative situations, the change in the curricula in 2018 abolished the disaster prevention and safe living sub-discipline. When all these studies and changes are taken into consideration, it is obviously seen that the natural disaster literacy course is necessary.

Considering all these studies and changes, the need for a natural disaster literacy course has emerged in order to overcome the shortcomings. For this reason, the aim of this study is to design natural disaster literacy curriculum.

2. METHOD

In this research, document review method, one of the qualitative research methods, was used. Within the scope of the research, documents were reached as a result of the literature review. The documents were obtained from the education programs of primary, secondary and high school courses of the Ministry of National Education (URL-1, URL-2, URL-3, URL-4) and the disaster protection and safe life intermediate discipline in the previous education programs. The data obtained by document analysis was analyzed by content analysis method. As a result of content analysis, acquisitions have been created for natural disaster literacy. Curriculum design has been prepared in accordance with the curriculum designs of the Ministry of Education. In this study, natural disaster literacy course is generally designed for high school level. In this context, the philosophy of the natural disaster literacy course, general objectives, the skills and values to be acquired, the acquisitions that will constitute the content of the course are included in the study.

2.1. The Philosophy and the General Objectives of the Curriculum

From the formation of the world to the present, natural disasters are experienced in a natural circulation. The number of natural disasters in which there is no human impact at the source is increasing day by day. Even the natural disasters that occur in the most remote corner of the world can be followed all around the world owing to the rapidly developing technology and communication. Moreover, the rapid and excessive increase in the world population increases the loss of life and property caused by natural disasters. Natural disasters that occur without any relation to borders of countries are now attracting attention both nationally and globally. Natural disaster literacy needs to be put on the agenda in order to reduce the material and immaterial losses of people. New generations need to be trained not only to have knowledge of natural disasters but also to develop attitudes against natural disasters and turn those attitudes into behavior. A natural disaster literate person is expected to be equipped with knowledge, attitudes and behaviors against natural disasters, setting an example to the people around them as well as being able to survive in the basic sense.

It is aimed with the natural disaster literacy program developed in this context that the individuals who will become natural disaster literate as a result of the program (Sözcü, 2019b, p.78);

- 1- will know the boundaries and principles of nature,
- 2- will understand the basic principles of natural disaster systems,
- 3- will know how to evaluate the reliable and scientific information related to natural disasters,
- 4- will be able to take conscious and responsible decisions before, during and after the natural disasters,
- 5- will be aware of the basic relationship between natural disasters and human beings and the social consequences natural disasters can cause,
- 6- will be able to analyze the effect of economic activity on natural disasters,
- 7- will be able to conduct many acts from following the meteorological reports to choosing the locations to live consciously and apply them to their life,
- 8- will be able to compare the national and international studies in the scope of natural disaster recovery,
- 9- will know that the natural disaster recovery should have a cultural scale,

- 10- will be aware of the destruction natural disasters can cause in the environment,
- 11- will be able to produce ideas to reduce the destructions of natural disasters and take concrete steps,
- 12- will be able to voluntarily take part in events on natural disaster trainings,
- 13- will be able to analyze the reasons and results of the natural disasters where they live,
- 14- will be able to follow the initiatives of executives for natural disasters and give warnings as much as possible,
- 15- will be able to contribute to turning natural disaster literacy into culture by transferring the knowledge they have to the people and especially the youth around them.

2.2. Skills and Values

There are a number of skills students are expected to develop with the natural disaster literacy program. These skills, some of which are also included in the curriculum of geography courses (URL-1); are geographical observation, fieldwork, mapping skills, spatial analysis and social participation.

Geographical observation will contribute to the realization of natural phenomena and understanding the place of these phenomena in natural processes. The ability to perceive the processes in the transformation of nature's mobility into the dimension of danger and disaster, to analyze the similarities and differences natural disasters have with other phenomena and to make predictions for the possible phenomena in the future.

Fieldwork will help students to gain first-hand information by visiting natural disaster risk areas or areas that have encountered natural disasters through scientific research and reporting stages.

Mapping skills will provide information about where natural disasters occur and the distribution of natural disasters on the earth. In the light of the information, analyzes will be made on the map and other factors related to the distribution of natural disasters will be related.

Spatial analysis will enable us to comprehend the situation of the living space according to natural disasters, to use the space correctly and consciously against natural disasters and to evaluate the space in the most accurate way possible after natural disasters. Spatial analysis will help students become aware of the place they live and examine it from a scientific point of view. Social participation skills will gain students the ability to act together against positive or negative phenomena in society. With this skill, students will be able to participate in search and rescue, to interfere, to participate in first aid, material and immaterial aid and support after a natural disaster.

Values are at the heart of the natural disaster literacy curriculum as they are in all curricula. The value judgments should also be developed in order that the acquisitions and skills the students are expected to gain, have a meaning. It is important that the dimensions of information and behavior expressed in natural disaster literacy are supported by the dimension of attitude. For this reason, the values that can be associated with natural disasters are included in the curriculum. These values are being scientific, solidarity, sensitivity, responsibility and helpfulness.

The value of being scientific will contribute to define how natural disasters occur in the light of science and to plan the actions to be taken during prevention, intervention and improvement phases. Responsibility requires individuals to do their part against natural disasters that may occur in their environment.

When sensitivity is considered within the context of sensitivity to the natural environment, it requires to act with the knowledge that human activities that are not suitable for the natural environment will trigger natural disasters; solidarity and helpfulness require co-operation in material-immaterial aid after any natural disaster.

2.3. Issues on the Implementation of the Curriculum

The natural disaster literacy curriculum focuses on the individual learning of the student. In the curriculum, the teacher has a role that directs, encourages and contributes to the process of the student at certain stages. The student is the person who observes, investigates and interrogates. The implementation phase of the curriculum consists of the dimensions of knowledge-attitude and behavior.

Students are not only the people who acquire knowledge, but also the people who develop attitudes with the knowledge they acquire and turn them into behavior. The focus of the curriculum is research-analysis based learning strategy. In this context, students are expected to carry out in-class studies as well as out of class studies. Environments in which information is structured through problem solving and cooperative learning is emphasized should be provided. Field studies, institutional visits, interviews with experts, theoretical and practical demonstrations will contribute to the achievement of the objectives of the program.

As a measurement and evaluation approach, both result and process oriented evaluation should be performed. Depending on the constructivist understanding, it is useful to provide students with multiple assessment opportunities. In addition to traditional assessment tools, alternative assessment methods such as performance tasks, student product files, project preparation, field observation reports self / peer assessment should also be employed.

2.4. Structure of the Curriculum

It is recommended that the natural disaster literacy course curriculum be compulsory at the level of 9th grade and 2 lessons per week. The units for the proposed program, the number of acquisitions, and the recommended course hours are as in Table 1.

Table 1. Natural Disaster Literacy Curriculum Units, Acquisitions, Course Hours and Rates

| Unit | Number of Acquisitions | Duration/Course hour | Rate (%) |
|-----------------------------------|-------------------------------|-----------------------------|-----------------|
| Introduction to Natural Disasters | 5 | 6 | 8,4 |
| Ground Based Natural Disasters | 15 | 24 | 33,3 |
| Climate Based Natural Disasters | 18 | 24 | 33,3 |
| Disaster Management | 7 | 10 | 13,8 |
| Natural Disaster Culture | 6 | 8 | 11,2 |
| Total | 49 | 72 | 100 |

Natural disaster literacy course which is prepared with unit based approach is planned as 72 course hours during an academic year. There are 5 units in the program, through which 49 acquisitions are aimed to be gained the students.

2.5. Structure of the Acquisitions

The definitions of the letters and numbers in the acquisitions are shown in Figure 1.

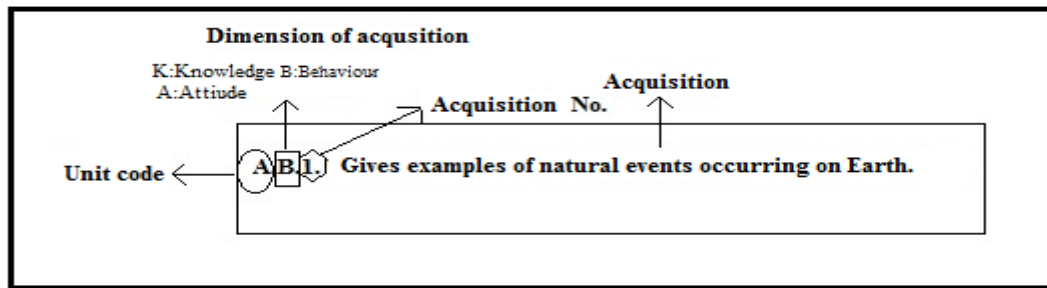


Figure 1. Definition of the structure of the acquisitions

The five units in the curriculum are indicated by letters (A, B, C, D, E). As shown in Figure 1, the middle letter shows dimension of natural disaster which the acquisition (prepared using Bloom's taxonomy) is related to. The figure in the last section describes the acquisition number and the given sentence describes the acquisition. The acquisitions were prepared to meet the dimensions of natural disaster literacy. In addition, skills and values related to the acquisitions are included in each unit.

UNIT I: Introduction to Natural Disasters

There are 5 acquisitions in this unit and 6 hours are envisaged for these acquisitions. At the introduction of the unit, first of all, natural phenomena are identified and sampled from the immediate surroundings. Natural phenomena are compared with natural hazards. The process of the natural hazard's transformation into a natural disaster is analyzed and the natural disaster state of the living space is evaluated. Finally, students' feelings for natural disaster are revealed. 4 of the 5 acquisitions in the unit are related to knowledge dimension of natural disaster literacy and 1 to attitude dimension. In this unit, it is aimed that the students gain the scientific observation and sensitivity to natural environment with their geographical observation and spatial analysis skills.

A.K.1. Gives examples to the natural disasters on earth.

A.K.2. Compares the natural phenomena and natural hazards.

A.K.3. Analyzes the process of natural hazards turning into natural disasters.

A.K.4. Evaluates the living space in the aspect of natural disasters.

A.A.5. Describes the feelings about natural disasters.

UNIT II: Natural Disasters of Ground Origin

This unit starts with the identification of natural disasters of ground origin. Among the natural disasters of ground origin, the earthquake which is the most widespread species has been discussed in a wide perspective from its formation and distribution stage; to the pre-earthquake period, during the earthquake and after it. Subsequently, issues related to other types of ground-based disasters are covered. There are 15 acquisitions in the unit which is allocated 24 hours in the curriculum. 6 of these acquisitions are related to knowledge dimension of natural disaster literacy, 3 of them are related to attitude dimension and 6 of them are related to behavior dimension.

In this unit, it is aimed that the students acquire the values of scientific observation, responsibility and sensitivity to natural environment with geographical observation, field study, spatial analysis and mapping skills.

B.K.1. Describes the natural disasters of ground origin.

- B.K.2. Questions the reasons and types of earthquakes.
- B.K.3. Analyzes the earthquake risk state of Turkey.
- B.K.4. Takes the precautions before earthquakes.
- B.B.5. Theoretically implements the precautions that can be taken against earthquakes.
- B.B.6. Prepares for earthquakes (earthquake emergency kit, watches for danger, earthquake exercise).
- B.B.7. Knows how to act during the earthquake and implements those acts.
- B.A.8. Realizes what can be possibly felt during earthquake.
- B.A.9. Embraces the importance of gathering at the emergency gathering area after the earthquake.
- B.K.10. Knows the destruction caused by volcanic eruption and tsunami disasters and how to act in the case of those disasters.
- B.K.11. Describes the reasons why the mass movements occur (landslide, rock fall, mud flow).
- B.A. 12. Embraces the necessary information to prevent landslide.
- B.B.13. Organizes what to do during landslide.
- B.B.14. Act appropriate to the security process after landslide.
- B.K.15. Evaluates the state of mass movement in Turkey and in the World.

UNIT III: Natural Disaster Caused by Climate

Starting with the introduction of natural disasters caused by climate, the unit consists of the formation stage of disasters such as flood, avalanche, hail, tornado, frost and thunderbolt; and acts to be taken before, during and after those disasters. After questioning the causes of climate change in Turkey, the analysis of climate disasters in the world. There are 18 acquisitions in the unit in which 24 teaching hours are allocated in the curriculum. 6 of these acquisitions are related to knowledge dimension of natural disaster literacy, 4 of them are related to attitude dimension and 8 of them are related to behavior dimension. In this unit, it is aimed that the students gain the values of scientific observation, responsibility, solidarity and sensitivity to the natural environment with geographical observation, field study, spatial analysis, social participation and mapping skills.

- C.K.1. Knows the natural disasters caused by climate.
- C.K.2. Investigates the reasons of floods and overflows.
- C.A.3. Embraces the precautions to be taken to prevent flood.
- C.B.4. Turns the acts to be taken during flood into behavior.
- C.A.5. Pays attention to the warnings of the authorities after flood.
- C.B.6. Shows the places with the risk of avalanche on the map.
- C.A.7. Learns the information to save the people during an avalanche.
- C.B.8. Shows how to move appropriately during an avalanche.
- C.K.9. Knows in which circumstances hail comes out.
- C.B.10. Takes the necessary precautions against hail.
- C.K.11. Describes the circumstances in which tornado occurs.
- C.B.12. Takes the necessary precautions against tornado.
- C.K.13. Realizes the effects of frost on economic activities.
- C.B.14. Adapts the effects of fog as a disaster on transportation through earlier experiences.
- C.A.15. Embraces the warnings of the authorities during extreme hot and cold weather.
- C.B.16. Implements the necessary acts to prevent thunderbolt.
- C.K.17. Evaluates the causes of climate change.

C.K.18. Defines the effects of disasters caused by climate both globally and nationally.

UNIT IV: Disaster Management

In this unit, the concept of disaster management is defined respectively and modern disaster management steps are mentioned. Disaster management studies at national and global scales are compared by including both individual and social attitudes and behaviors before, during and after disasters. There are 7 acquisitions in the unit which is allocated 10 teaching hours in the curriculum. 3 of these acquisitions are related to the knowledge dimension of natural disaster literacy and 4 of them are related to attitude dimension. In this unit, it is aimed that students gain the values of being scientific, responsibility, being sensitivity to natural environment, solidarity and helpfulness through spatial analysis and mapping skills.

- D.K.1. Knows the concept of disaster management and its steps.
- D.K.2. Evaluates risk and crisis management in the aspect of their features.
- D.A.3. Realizes the personal responsibilities during disaster management.
- D.A.4. Embraces the importance of preparation before disaster.
- D.A.5. Acts willingly for disaster intervention.
- D.T.6. Participates in the aid process after disaster.
- D.B.7. Compares the disaster management actions in Turkey and around the world.

UNIT V: Natural Disaster Culture

In this unit, students' responsibilities to be taken as individuals in the face of natural disasters, contributions to social efforts, being a conscious citizen are discussed. There are 6 acquisitions in the unit which is allocated 8 hours in the curriculum. 2 of these acquisitions are related to knowledge dimension of natural disaster literacy, 1 is related to attitude dimension and 3 are related to behavior dimension.

In this unit, it is aimed that students gain the values of being scientific, responsibility and solidarity through spatial analysis and social participation skills.

- E.A.1. Realizes that being prepared for natural disasters is a civic responsibility.
- E.B.2. Follows the acts on natural disasters (regulations-laws).
- E.B.3. Inform their family and people around them about disasters.
- E.B.4. Takes active role in school programs about natural disasters.
- E.K.5. Knows the effect of natural disasters on the society.
- E.K.6. Comprehends the importance of institutions about natural disasters.

3. DISCUSSION AND CONCLUSION

In recent years the number of natural disasters in the world and Turkey, there has been a significant increase in life and property losses caused by the disaster. Taking precautions against this situation is possible with natural disaster training. When foreign studies are examined, Brown, Haun and Peterson (2014) suggested disaster literacy model for vulnerable groups. Accordingly, disaster literacy model can be used with other risk and communication models guide the development of educational materials that meet the needs of vulnerable subgroups and help them progress to higher disaster literacy levels. Sampurno, Sari and Wijaya (2015) aimed to improve students' disaster literacy. This paper discusses about innovation strategy to build students' disaster literacy through integrating STEM (Science, Technology, Engineering,

Mathematics) and disaster (STEM-D) education. In addition, Kanbara et al. (2016) disaster risk-reduction literacy, Chung and Yen (2016), Rahim and Wu (2015) disaster prevention literacy, Kimura et al. (2017) disaster management literacy and Goddard (2017) worked on disaster preparedness knowledge, beliefs, risk-perceptions. These studies do not have a curriculum development feature. Therefore, in the research, a curriculum for natural disaster literacy course was developed and proposed. The acquisitions of the curriculum are not limited to the dimension of information. As it is thought that being a natural disaster literate will be possible by reaching the levels of attitude development and behavior, acquisitions have been focused on these dimensions. When the current curriculum acquisitions are evaluated by Sözcü and Aydınöz (2019) it has been tried to overcome the shortcomings of the gains regarding the behavior dimension. In addition to the basic philosophy and general objectives of the curriculum, the values such as geographic observation, fieldwork, mapping skills, spatial analysis, social participation skills and being scientific, responsibility, solidarity, sensitivity to natural environment and helpfulness are also defined. With the practice of this curriculum, students are expected to be natural disaster literate. The proliferation of individuals with natural disaster literacy is thought to contribute to the reduction of material and immaterial damages caused by natural disasters. Therefore, it is recommended that the competent units of the Ministry of National Education initiate this program as a pilot scheme.

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