

Metaphorical perceptions of the secondary school students regarding the concept of soil

Sibel Yazıcı

Department of Primary Education, Education Faculty, Afyon Kocatepe University, Turkey.

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ABSTRACT

The importance of the soil being a source for human existence and sustaining life has caused to the wide meaning to the soil. The aim of this study is to analyze the metaphorical perceptions of middle school students about the concept of soil within the social studies program. The participants of the study are secondary school students selected through purposeful sampling. Phenomenology, one of the qualitative research methods, was used in the study. In the study the perceptions of the participants about the concept of soil and the meaning they attributed to this concept were analysed to reveal. The data of the study were collected through the statements such as "Soil is like Because...". 89 secondary students have produced 36 metaphors about the concept of soil. Frequent metaphors produced by students include: human, life, being living, homeland, mother and heart. Metaphors are grouped by considering the subject-source relationship, and as a result, two categories and two sub-categories emerge. Soil, a living being for students is perceived in terms of the source of life and productivity. Soil is associated with both social and science subjects at this point. Soil perceived as a value is considered both a national-spiritual value and an economic value.

Keywords: Soil, soil as a living being, soil as a value, secondary school students, metaphor.

E-mail: syazici@aku.edu.tr. Tel: 505-4012150.

INTRODUCTION

Soil is a concept that has more than one meaning. Soil has therefore been a multidimensional perceived concept. The soil, above all, is a material in which many living organisms exist and which allows plants to adhere with the water it contains and forms a food source with organic and inorganic substances (Ergene, 1993; Yıldız et al., 2011). In short, the soil that forms the main source of life is a living organism. When mankind stepped on the moon surface for the first time in 1970, a huge wave of excitement surrounded the world. Was there soil in the place where man stepped? When the soil brought by the astronauts from the moon was analyzed, the results of the analysis were controversial in that it had similar characteristics to the surface of the ground, but it did not contain any necessary quality for agricultural activities. Soil scientists argued that the material brought from the moon cannot be defined as soil due to the fact that it did not contain any living organisations (Ortaş, 2017: 4). Soil is also the main source of human creation. Indeed, the

Latin name of the human species "homo " comes from humus (Hillel, 1998). The humus makes the soil fertile, provides nutrients to the plants and microorganisms (Prusty and Azeez, 2005). In this case, the soil was called a symbol of vitality and abundance. In Turkish culture, soil is accepted as a fertile and homeland, which gives life because of the raw material of man, produces as the main. So soil is the basis of life. (Töret, 2019; Ögel, 1987). The soil that forms the basis of the cosmos is fertile. This is an indication of his vitality (Eliade, 2003). In ancient mythology, the soil was sacred as a place to live. It was accepted as a homeland in the modern era (Kaya, 2019).

Soil is important for sustainable environment today. Due to the growing world population, the growing economy and the growing level of luxury and prosperity, the land is consumed rapidly, which can be described as occupation. Soil that is not a renewable resource. It is rapidly polluted (Karaca and Turgay, 2012). Our

relationship with the soil needs to be reviewed for the sustainable environment. Fietkau and Kessel (1981) are of the opinion that sociological and psychological factors are effective in the formation or non-formation of pro-environmental behaviors. In their five-stage model on the environment, they state that environmental knowledge is important for attitude and value formation. World Peoples' Climate Change and Land Mother's Rights Conference convened in Bolivia (April 22, 2010). As a result of the decision; It has been stated that every individual and institution, especially the peoples and nations of the world, should respect and work in this direction as part of the existence of the mother of the earth through teaching, education and awareness (Solon, 2018).

Educational programs of social studies courses have always indicated the significance of soil for people. The outcomes covered in the learning field of production and consumption in these programs mostly aim to enable students to raise awareness and develop a positive attitude towards environment (Tanrıverdi, 2009). In the educational program for the seventh grade the learning domain of production, distribution and consumption covers an outcome which focuses on the significance of soil as follows: "Students explain the place and importance of soil in production and management using proper examples from past and present." Studies on soil are mostly concerned with natural disasters (Ural Keleş and Dizikısa, 2019; Turan and Kartal, 2012) and environmental pollution (Mutlu and Tokcan 2012; Genç et al., 2016; Çağlar, 2017; Doğan, 2017). Environmental education which is a complex pattern attempts to improve individuals' environmental awareness, their knowledge and attitudes on environment to make it possible for them to join such topics in an affective way (Kollmuss and Agyeman, 2002). Therefore, how and in which way the soil is perceived is important for raising awareness. However, the number of studies on the significance of soil is relatively less. One of such studies is a project on environmental education entitled "We get to know the soil with Tipitop and his friends." The project aims to introduce preschool children (5-6 years old) to soil and soil-related concepts (properties of soil, living beings under / above the soil, plants grown in soil, fruits, vegetables, the importance of soil, erosion and its causes and consequences) and to increase their sensitivity (Gülşay et al., 2011). Another work was by Gürlen and Köseoğlu (2019). They analyzed the teacher candidates' views on soil and soil pollution with metaphors'.

Metaphors aiming to reveal the perception of individuals about the object to be measured are effective data collection tools. The perceptions of the participants about a specific topic may provide necessary information that can be used in designing the teaching of this topic (Kılcan, 2017). Lakoff and Johnson (2003) state that most of our conceptual system has a metaphorical meaning when looking at linguistic evidence, and that this system, called metaphor, means embodying, understanding and

organizing information mechanisms through understanding and experience of another entities. Metaphors are an appropriate measurement tool in revealing the meaning of a concept such as soil that creates both concrete and abstract perceptions (East, 2009; Miller et al., 2002). Metaphors are useful tools to remove the gap between what students know and see in their daily life and what they are expected to learn at schools (Pramling, 2010).

The study aims to reveal the perceptions of secondary school students about the concept of soil through metaphors based on all these points. For this reason, the study sought answers to the following questions:

1. What are the perceptions of the metaphor of secondary school students about the soil?
2. Which categories are secondary school students' perceptions of soil metaphor grouped under?

MATERIALS AND METHODS

Research design

In line with the research questions the phenomenology, one of the qualitative research methods, was used in the study. The main focus of phenomenological approaches is how a person perceives, thinks or feels a situation. Therefore, phenomenology is a method that provides an understanding of human behaviors and responses (Graumann, 2002) and therefore, contains an in-depth analysis of cases that are encountered in life but are not emphasized much (Yıldırım and Şimşek, 2018). Through this method, the researcher aims to understand the perceptions and reactions of the participants by understanding their inner world researching various perceptions or reactions related to a particular phenomenon (Fraenkel et al., 2012). From this point on, the perceptions of secondary school students regarding the concept of soil were tried to be revealed.

Participants

The participants of the study are 108 students were educated in two secondary schools under the Directorate of National Education of Afyon province in spring semester year of 2018-2019. 11 students failed to produce metaphors. Therefore participated in the study a total of 89 students (47 women and 42 men). The participants were selected using the criterion sampling which is part of the purposive sampling techniques. Purposive sampling is a technique that allows in-depth study of situations that are considered to provide rich information about the topics at hand. The researcher tries to understand nature and social events or phenomena in the context of selected situations and to discover and

explain the relationships between them. In the studies in which the criterion sampling is employed observation units are formed from people, events or situations with certain qualifications. The units that meet the criteria (basic qualities) predetermined for the sample are taken into consideration (Büyüköztürk et al., 2009). Participatory group criteria; the importance and protection of the soil in the 7th grade social information program is the course acquisition. Thus, the participant group of the study consists of those who are considered to have a sufficient level of knowledge about the concept of soil.

Data collection

In the present study primary structure is metaphors produced by the participants. Metaphors which are described as developing analogies generally involve analogies between a known and an unknown or less known entities to provide a complete understanding of the latter. Metaphors are considered as the most powerful cognitive tools in which thoughts are structured, directed and controlled in relation to the formation and functioning of events (Saban, 2004).

The participants were asked to fill in the blanks in the following statement: "*Soil is like Because...*". In this statement the word like is used to force the participants to develop an analogy between the concept that is less known and and the source of the metaphor (Saban, 2008). Metaphor writing time was determined as a lesson time in accordance with the class and age levels of the participants. Taking into account the genders of each student's answer paper for data analysis, FÖ1, MÖ1... encoded.

The data obtained were examined using the content analysis which is a method that allows to reveal the social reality (Taşancıl and Aslan, 2001: 21). In the study the data obtained were analysed in four step as follows:

Listing and categorization: All metaphors produced by the participants were transferred into the MS Excel program based on the group of participants. The coding process, which is the naming process by separating the text as indicated by Creswell (2012) during the listing phase, was carried out by considering the relation between the source and subject to form the categorization basis. These were excluded from the analysis in addition, two statements by these students were unmeaningful, and therefore, these were submitted to the field expert. One of these statements was produced by FS28: "Soil is like that of beautiful life. Because for the country for the soldiers for war." The other one was produced by FS29 and is given as follows: "Soil is like very important. Because we grow fruits and vegetables." During the categorization the metaphors which were similar were grouped into the categories taking into account the codes. During the

listing process, it was deemed appropriate to put the people and mother metaphors, which are expressed most, into different groupings in terms of source-subject relationship.

The development of the categories: The source-subject relationship in regard to the metaphors and the justifications given by the participants for the metaphors were taken into consideration while categorizing. Berg and Lune (2015) describe the categorization which is one of the steps of the qualitative content analysis as shown in Figure 1.

Considering the above-mentioned principles, the metaphors about the concept of soil produced by the participants were first classified into the groups of concrete and abstract metaphors. It was seen that the participants considered the soil as a living entity and an abstract value. The former type of soil metaphors is found to have two subgroups: a necessity for life and the productivity of soil. The latter of soil metaphors are categorized into two subgroups: material and spiritual. Those metaphors which are related to material value are sub-categorized into economy, and those related to spiritual value are classified as national and spiritual value (Figure 1).

Following a process of repeated reading of the data several times, category matches were presented to the field expert, leaving no metaphors other than categorization, and then for examination. In line with feedback from the field expert, two metaphorical descriptions produced by secondary school students were excluded from the analysis. On the other hand, it has been observed that mother-and human-based Earth metaphors can be put in multiple categories simultaneously.

Validity and reliability: Validity and reliability are two important and necessary criteria to ensure credibility of the research results (Yıldırım and Şimşek, 2018). In the study, the following activities were made to ensure the validity:

1. The review of the studies on the concept of soil, and expert opinion about the tool was taken.
2. Participants were formed from groups that are thought to have reached a sufficient level of knowledge about the concept of soil.
3. In the findings section of the study, the data concerning the categories were discussed through the examples.

Concerning the reliability of the study a field expert analysed the codings and categories developed. The interrater reliability was found using the following formula developed by Tawney and Gast (1984): $[(\text{Mutual agreement}) / (\text{Mutual agreement} + \text{Disagreement})] \times 100$.

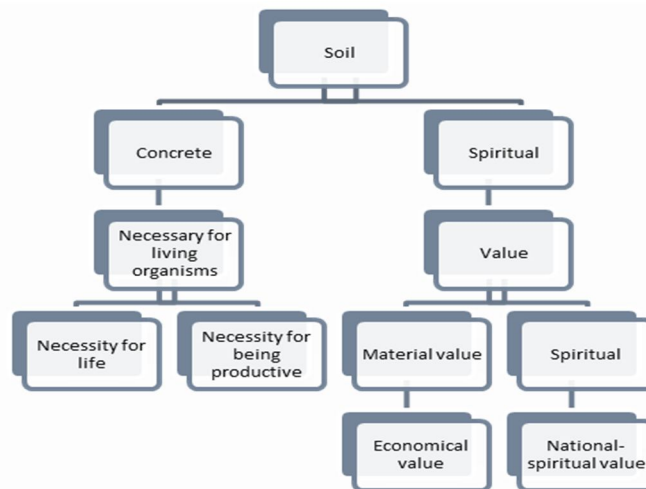
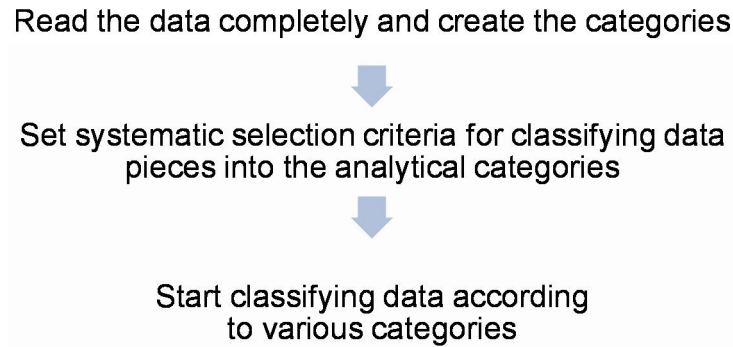


Figure 1. Categorization of the metaphors about soil.

The reliability coefficient is found to be 96%. Miles and Huberman (1994) state that the reliability coefficient which is 70% or more refers to reliability for qualitative studies.

Discussion of findings based on the frequency of categories: Eighty-nine metaphors produced by the participants were transferred to the MS Excel program for quantitative analysis. The frequency (f) and percentage (%) of these metaphors and categories were found. As a result of content analysis, the data were grouped under two categories and four subcategories. The findings were discussed using participants' statements.

FINDINGS

In this section, the categories and sub-categories in regard to the metaphors about soil are presented and tables indicating the data are presented supporting with metaphor examples, and the category rankings are compared.

Table 1 presents on the land-related metaphors produced by secondary school students. A total of thirty-six soil metaphors have been produced. These

metaphors are listed as follows: Man (15), Life (10), life (6), being (6), Homeland (6), Mother (4), Heart (3), water (2), Earth (2), Tree (2), We (2), beautiful (2), and pure matter (2). Others are given in the corresponding table.

The metaphors of human, life, being, mother, heart, breath, tree, oxygen... show that the soil is regarded as a living being. The metaphors of homeland, nation, country, Prophet Adam, heaven, teacher, pure matter... mean that the soil is considered a valuable asset.

Soil category as a living being

Metaphorical phrases have been analyzed. It shows that the category of soil as a living being is divided into sub-categories of soil as source of life and soil as source of productive (Figure 2).

Table 2 also shows the total number of metaphors included in the soil category as a living being. Sixty-four students have produced twenty-three metaphors. Human, life, being, living, mother, heart, water, world, the source of life, breathable, parents, oxygen/air, medicine, tree, flower, women, new generation, brother, book and teacher metaphors are produced. Human and mother metaphor expressions emphasize both the source of life

Table 1. Metaphors about soil which are produced by the secondary school students participated in the study.

Rank	Metaphor	Frequency (f)	Rank	Metaphor	Frequency (f)
1	Human	15	19	Flower	1
2	Home	1	20	Life	11
3	Being	7	21	New generation	1
4	Our home	1	22	Living	6
5	Mother	4	23	Meal	1
6	Parents	1	24	Heart	4
7	Water	2	25	Brother	1
8	The world	2	26	Factory	1
9	Tree	2	27	Heaven	1
10	Us	2	28	Book	1
11	Beautiful	2	29	Prophet Adam	1
12	Medicine	1	30	Pure substance	2
13	Source of life	1	31	Treasure	1
14	Nation	1	32	Step	1
15	Indestructible house	1	33	Country	1
16	Breath	1	34	Oxygen/air	1
17	Power	1	35	Homeland	7
18	Woman	1	36	Teacher	1
Total					89

**Figure 2.** Soil category and subcategories as a living being.

and productive being property of the soil. This increases the total frequency of metaphors.

The number of metaphors under the subcategory of soil as a source of life is seventeen. It was produced by fifty-four students. These metaphors are as follows: human (10), life (11), living (6), being (7), mother (2), heart (4), water (2), the world (2), source of life (1), breath (1), parents (1), oxygen / air (1), pure substance (2) and medicine (1), tree (2), flower (1), women (1) and meal (1). The metaphor that stands out in the category is human. It is expressed with metaphors of "trees, flowers", which the soil means in terms of plant life. In terms of soil as a source of life is perceived as heart, being, medicine and life.

Some of the examples of these metaphors are as follows:

MS17 and FS35 "Soil is like a human. Because human was created from soil."

FS33 "Soil is like our life. We are with it when we are born and we are with it when he dies."

MS33 "Soil is like life. We are born and die in life."

FS34 "Soil is like a woman. The analogy of mother earth has not been made in vain. It feeds all people without expecting nothing from them."

FS36 "Soil is like mother. It grows us."

MS12 "Soil is like mother. It is head of people, animals and plants."

MS29 "Soil is like a heart. A person cannot live without a heart as he cannot live without soil."

FS3 "Soil is like a tree. It is the source of life."

MS11 "Soil is like a flower. It helps us to live and take breathe."

FS21 "Soil is like medicine. If there is no soil, we can die."

MS 36 "Soil is like food. Because we eat plants, animals eat other plants, and we eat them."

FS23 "Soil is like life. We're buried just as we came from the ground."

The secondary school students participated in the study produced four different types of the metaphors about soil which emphasized the concept of soil as a productive being. The metaphors were produced by ten students. These are as follows: human (5), mother (1), new

Table 2. Metaphors about soil as a living being categories and sub categories secondary school students.

Categories	Sub-categories	Metaphors	Number of metaphors	Frequency (f)
Soil as a living being	Soil as a source of life	human (10)	17	54
		life (11)		
		living (6)		
		being (7)		
		mother (2)		
		heart (4)		
		water (2)		
		the world (2)		
		source of life (1)		
		breath (1)		
		parents (1)		
		oxygen/air (1)		
		medicine (1)		
		tree (2)		
		flower (1)		
		women (1)		
		meal (1)		
	Soil as a productive being	human (5)	6	10
		mother (1)		
		new generation (1)		
brother (1)				
book (1)				
Total	teacher (1)	23	64	

generation (1), brother (1), teacher (1) and book (1). The metaphor that stands out in the soil as a productive being subcategory is again human and mother. The soil like the mother is productive. The “new generation” metaphor states that the soil must be regeneration to be productive.

Some of the examples of these metaphors are as follows:

MS16 “Soil is like a human. Because if you look at it, it gives us blessings. If you don't look at us, it insults us.”

MS14 “Soil is like our mother. If she likes us, she gives us fruit and vegetables even though we are ingratitude.”

MS22 “Soil is like new generation. When we plant something, new things come out.”

MS40 “ Soil is like a brother. Sometimes it will be offended to you, sometimes it loves you and becomes very productive.”

FS14 “Soil is like a book. It grows as you read and it grows as you water it.”

MS8 “Soil is like a teacher. They are diverts (quided), teaching everything.”

Soil as a value

Metaphorical phrases have been analyzed. It shows that

the category of soil as a value is divided into sub-categories of soil as a national and spiritual value and soil as an economical value (Figure 3).

Table 3 also shows the total number of metaphors included in the soil category as a value. The secondary school students produced sixteen metaphors which are category of soil as a value. The metaphors were produced by twenty-four students. These metaphors are as follows: homeland, us, beautiful, nation, indestructible house, power, home, our house, heaven, Prophet Adam, country, step, pure substance, factory and treasure .

The secondary school students produced fourteen metaphors which are subcategorized in soil as a national and spiritual value under the category of soil as a value. These metaphors are as follows: homeland (7), us (2), mother (1), beautiful (2), nation (1), indestructible house (1), power (1), home (1), our home (1), heaven (1), Prophet Adam (1), country (1), step (1), pure substance (2). The stand-out metaphor for this category is Homeland. The metaphor of the mother is associated with the homeland. It is expressed in the metaphor of “step” that the soil should be valued. The beginning of the soil-human relationship is expressed in the metaphor of Prophet Adam. Students recognize the soil as life itself.

Some of the examples of these metaphors are as follows:



Figure 3. Soil category and subcategories as a value.

Table 3. Metaphors about Soil as a Value categories and sub categories Secondary School Students.

Categories	Sub-categories	Metaphors	Number of metaphors	Frequency (f)
Soil as a value	Soil as a spiritual-national value	homeland (7) us (1) mother (1) beautiful (2), nation (1), indestructible house (1), power (1), home (1), our house (1), heaven (1), Prophet Adam (1), country (1), step (1), pure substance (2),	14	22
	Soil as an economical value	factory (1), treasure (1)	2	2
Total			16	24

FS38 "Soil is like homeland. Because the country without land has no homeland."

FS44 "Soil is like a homeland ... It is an important and homeland for countries."

MS27 "Soil is like us... We are created from earth, we die from earth."

MS4 "Soil is like mother. It has been a homeland to thousands of civilizations and it has protected them."

FS24 "Soil is like steps... It raises and lowers when available."

FS20 "Soil is like Prophet Adam... It came to my mind because he was the first creature created from the earth."

FS18 "Soil is like pure substance ... As soon as you touch the ground, you throw your nerves."

In the subcategory of soil as an economical value the secondary school two students produced two metaphors. These metaphors are as follows: factory (1) and treasure (1). The soil is an economic value as a raw material. it is expressed by the metaphor "factory". The "treasure" metaphor states the value of owning soil.

The metaphor examples are as follows:

FS11 "Soil is like a factory ... It is the raw material of all

products. If the soil is not fertile, no product is grown."

FS22 "Soil is like treasure ... If you buy soil, you get everything."

DISCUSSION AND CONCLUSION

In the study, it is aimed to reveal the perceptions of secondary school students about the concept of soil through metaphors. Based on the learning outcome covered in the seventh grade social studies educational program, namely "Students express the importance of the soil in production and management from past to present.", the participants of the study are secondary school seventh grade students. In the study 89 secondary school students produced a total of 36 metaphors on the significance of soil. The number of metaphors indicates that the secondary school students participated in the study have a perception of soil. Therefore, it can be argued that there is a certain level of awareness about the soil among the participants. One of the reasons for it is the change made in the educational program for social studies courses (2005) which added learning outcomes to the programs about the sustainable

soil management in the learning domain of production, distribution and consumption (Kaya and Tomal, 2011).

It is found that soil is mostly identified with the concepts of human beings, life, heart, living, homeland, mother and beloved. This shows that students perceive the soil as both a living being and a value. The analysis of metaphor statements (human beings, life, living, beloved, mother, heart, water, the world, the source of life, breath, parent, oxygen / air, medicine, tree, flower, woman, next generation, brother and book) shows that when soil is considered to be a living being it is perceived as a life-related and productive element. The perception of soil is stronger in terms of life. The metaphors of water, oxygen and heart suggest that the subject is associated with science lessons. Similarly, Kaymakçı (2016) in his study examining the relationship between social studies and science and technology lesson topics, the learning outcome given in the science information 2.9., namely "Students becomes aware of the importance of air, earth and water for life in the Earth and Universe (Our Planet Earth)." was related to social studies topics. This shows that metaphors can be used as a measurement tool to study or reveal interdisciplinary conceptual relationships.

The soil, which is perceived as a living being, is mostly associated with people. Indeed, soil, as a source of raw materials, is a basic element for human beings as a technical and socio-economic infrastructure and for human activities (Blum et al., 2006). This situation is also reflected in the 7th grade social studies textbook and in the Economics and Social Life (5th Unit) Unit (MEB, 2019). This relationship is addressed under the topic of "mother earth". On the other hand, the broadest meaning of the soil is given as its main concept. Soil is perceived as a vital and productive as well as a national spiritual value. The students integrated the land with the woman and her gender characteristics from a traditional perspective (Aça, 2018).

As stated earlier the participants also perceive soil as a value. In the dictionary of the Turkish Language Society (1998) value is defined as an abstract measure for determining the importance of something and as the equivalent of something that can be measured with money. Soil as a value has both abstract and concrete features. The statements of metaphor of soil as a value (homeland, us, beauty, nation, indestructible home, power, nest, our home, heaven, Hz. Adam, country, stair, raw material, teacher, treasure and factory) show that the abstract features of soil as a value include its conception as a national and spiritual value. The concrete feature of soil as a value includes its conception as an economic value. Similarly, previous studies report that homeland is conceptualized as soil and a piece of land (Er Türküresin, 2018; Duran and Aladağ, 2018). Therefore, students perceive the soil as a concept equivalent to homeland. The number of students perceiving the soil as an economic value is found to be very low. However, the textbook used in the seventh grade social studies course (2018) has a unit, Unit 5, in which economic activities

based on agriculture are discussed (MEB, 2018). Şeker and Osmanoğlu (2015) argue that economic concepts included in the textbooks for the 6. Grade and 7. Grade social studies courses contribute to the students' economic literacy and their being conscious producers. However, the findings of the study shows that awareness about the economic value of the soil should be further improved among the students. As a matter of fact, Koca and Erol (2011) state that in social studies educational programs the topics of soil and its conservation are not sufficiently addressed which should be emphasized at every grade level.

Based on the findings of the study the following recommendations on both metaphor use and soil perception are developed:

1. The relationship between soil and other disciplines in social studies educational programs can be revealed through metaphors.
2. Qualitative studies can be conducted to reveal the soil-human relationship on a sample of secondary school students.
3. Qualitative or quantitative studies can be conducted with secondary school students to reveal their perceptions about soil as a national spiritual value .
4. Course activities that emphasize the economic value of the soil can be organized in secondary schools.

The scope of the study can be expanded. Metaphorical studies on soil perception can be performed at every grade level. Thus, how the soil is perceived can be revealed. Social studies programs can be restructured in accordance with this perception.

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