

Investigation of Changes of Pre-service Teachers' Opinions about Environmental Education with Drawing Analysis

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Abstract: The purpose of this study is to investigate the effects of the project "Nature Education in Ihlara Valley (Aksaray) and Its Surrounding Area III" supported by The Scientific and Technological Research Council of Turkey (TUBITAK) on the pre-service teachers' environmental opinions. Drawings were used to collect data in the present study. Two questions were asked pre-service teachers to determine their opinions about environment and environmental education before the project and at the end of the project: The present study is an attempt to seek answers to these questions asked to pre-service teachers "In what kind of environment do you want to live? Please draw it" and "What kind of environmental education do you want to give to your students? Please draw it". Then, the opinions of the students expressed in their drawings are collected under the suitable categories. The opinions of the pre-service teachers are conceptualized under the emerging categories and tables of frequencies are formed for the concepts.

Key words: drawings, environmental education, pre-service teachers

Introduction

Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings (UNESCO-UNEP, 1985). Various environmental education programs (field trips, trekking, camping, and adventure activities) help children to develop effective relations with their natural environment, to improve their sensitivity towards the nature, and their social relations (Palmberg & Kuru, 2000). The importance of summer camps in raising students' awareness of environmental values and learning the natural processes in their natural environments (Dresner & Gill, 1994); and the importance of ecological programs in creating positive changes in their environmental behavior (Bogner, 1998) are emphasized. When groups received information on environmental issues and appropriate action strategies, they showed an increase in environmentally responsible behavior and an increased understanding of environmental action (Jordon, Hungerford & Tomera, 1986; Newhouse, 1990). Direct experience with a variety of environmental action strategies and lifestyles that help to ameliorate environmental problems--such as the use of solar energy to heat water--is also important if students are to learn new behaviors. Role modeling, use of case studies, active participation in an environmental action project, and participation in simulations of environmental issue resolution are all techniques that can develop action skills (Dresner & Gill, 1994).

There are 41 national parks in Turkey (Varnacı Uzun, 2011). Based on the applications in America, nature education was initiated in Termessos, Kackar, Kazdagi, and Goreme national parks within the framework of the project called "Scientific Environmental Education in National Parks" by Land Sea Atmosphere and Environment Research Group of TUBITAK in 1999 in Turkey (Ozoner & Yalcin, 2000; Keleş, 2011). There is a lot of research looking at the effects of nature education programs carried out in national parks on students' environmental knowledge, attitudes, and behaviors. However, the number of studies dealing with in what kind of environment pre-service teachers want to live and what kind of environmental education they want to give to their students is quite limited. Therefore, following two questions were directed to the pre-service teachers before they participated in a nature education program.

- In what kind of environment do you want to live? Please draw it.
- What kind of environmental education do you want to give to your students? Please draw it.

The responses to these questions were sought through drawings. Drawings are a way to find out learners' previous experiences or what they have learnt about a subject (Korkmaz, 2004). Thus, drawings may be effective in providing students with opportunities to improve their observational skills and allowing them to understand the natural world (Dempsey & Betz, 2001).

Materials and Method

Study group

The study group consists of 30 pre-service teachers studying in 4 different departments (preschool education, primary education, social studies, science and physics) of the education faculties of 17 universities who participated in nature education program carried out on 27 August-02 September 2012 with the support of TUBITAK. 18 (54%) of the participants are girls and 12 (46%) are boys.

Activities carried out within the framework of the nature education

With this project, where active learning methods were used, the pre-service teachers were introduced to geological, geomorphologic, floral, faunal and cultural features of the natural environment and to the problems stemming from the mass tourism activities taking place in the region. In this respect, some field studies were carried out on the volcanic structure around Ihlara Valley and Hasan Mountain. Besides field studies, some activities in a classroom setting were also carried out. In the classroom setting, creative drama activities were performed for the pre-service teachers to get to know each other and take individual responsibilities.

Data collection instruments

The present study consists of two parts. In the first part, what was expected from the pre-service teachers was to think about their dream environment where they want to live and then draw what they thought. In the second part, the aim was to elicit the opinions of the pre-service teachers about the environmental education they are planning to give in the future. For this purpose, the same questions were asked on the first and last days of the study.

Data analysis

The opinions emphasized in the drawings of the pre-service teachers were separately conceptualized by the researcher. Then the tables of frequencies showing how many times a concept was repeated by the students were formed. Then, the conceptualizations of the researchers performed separately were brought together to subsume them under common categories. The data obtained in this way were then interpreted.

Results

In this section, the pre-service teachers' opinions about environment and environmental education are presented before and after the nature education they were involved in:

The Pre-service Teachers' Opinions about Environment and Environmental Education before Nature Education

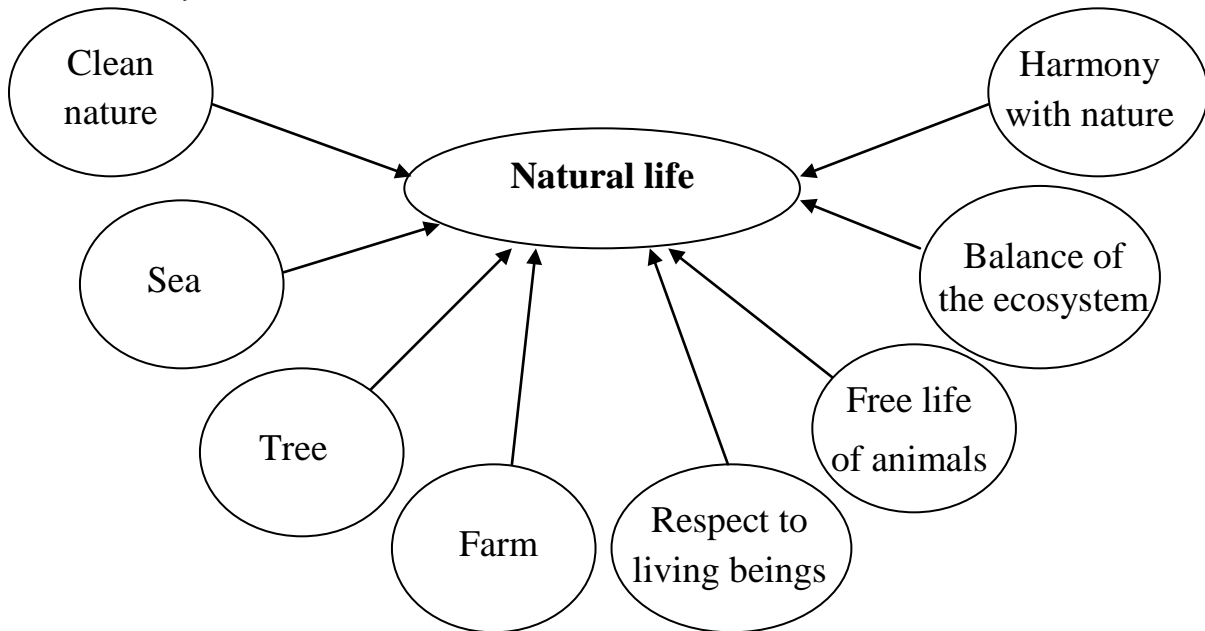
The responses of the pre-service teachers given to "In what kind of environment do you want to live? Please draw it" were classified under the categories presented in Table 1. As can be seen in Table 1, the pre-service teachers' responses given to this question before they participated in the nature education project are collected under five categories. Out of these categories, natural life and sustainable life categories came to the fore.

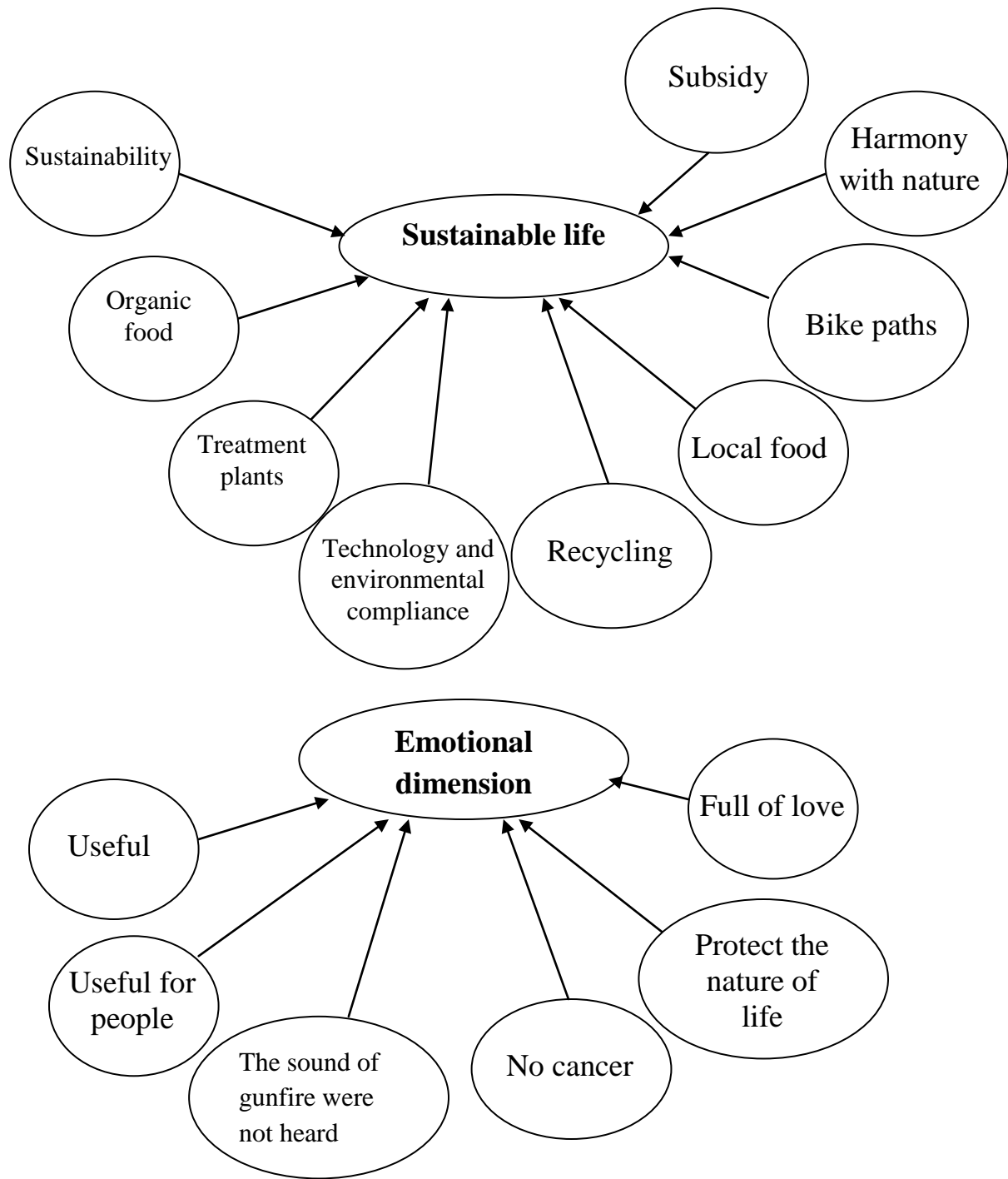
Table 1: The pre-service teachers' responses given to the question "In what kind of environment do you want to live? Please draw it."

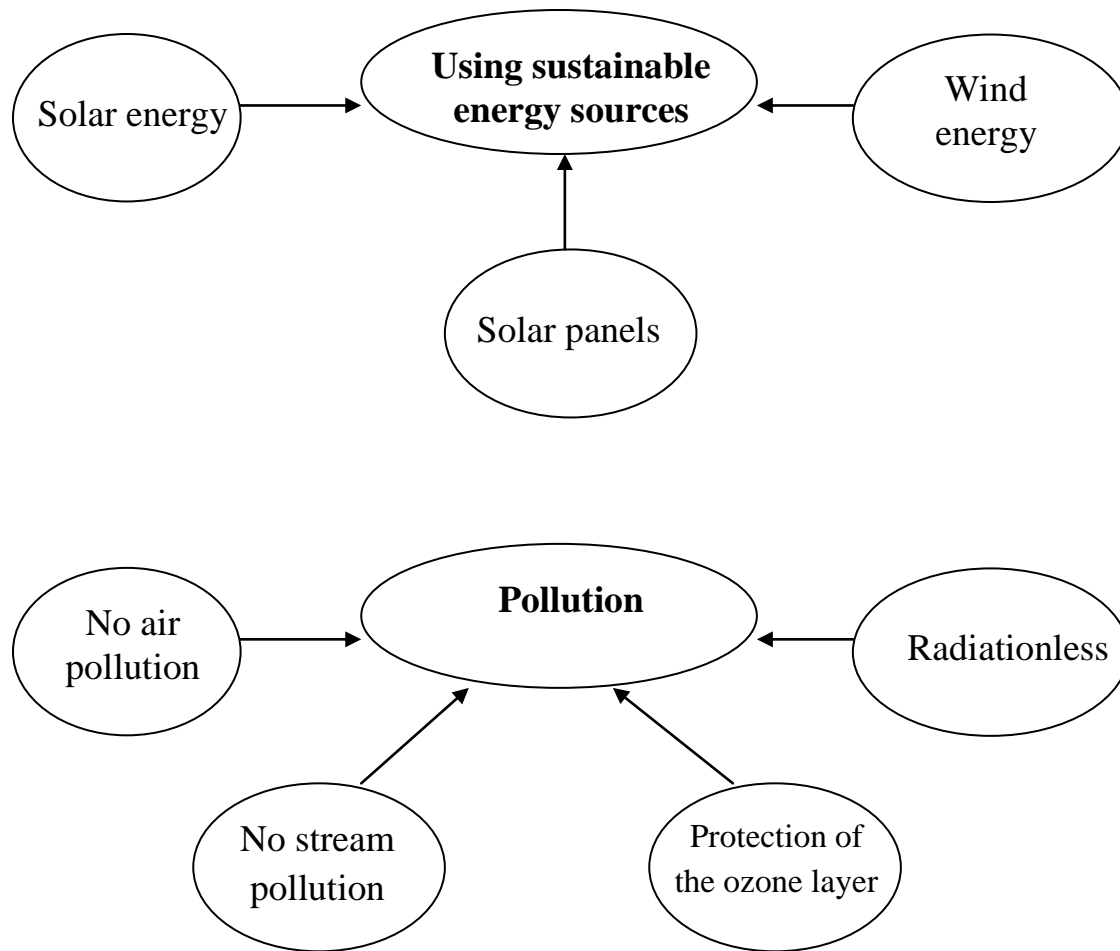
Categories	f	%
Natural life	25	42,37
Sustainable living	18	30,50
Emotional dimension	7	11,86
The use of renewable energy sources	5	8,47
Pollution	4	6,77

In figure 1, the concepts frequently mentioned by the pre-service teachers in each category are visualized.

Figure 1: Cognitive map of the responses of the pre-service teachers given to the question "In what kind of environment do you want to live? Please draw it."







The pre-service teachers' responses given to the second question were separately investigated by the researchers and then put into certain categories. Then, tables of frequency showing how many times each concept was repeated by the students were constructed. Then, the conceptualizations of the researchers performed separately were brought together to subsume them under common categories. The data obtained in this way are presented in tables below:

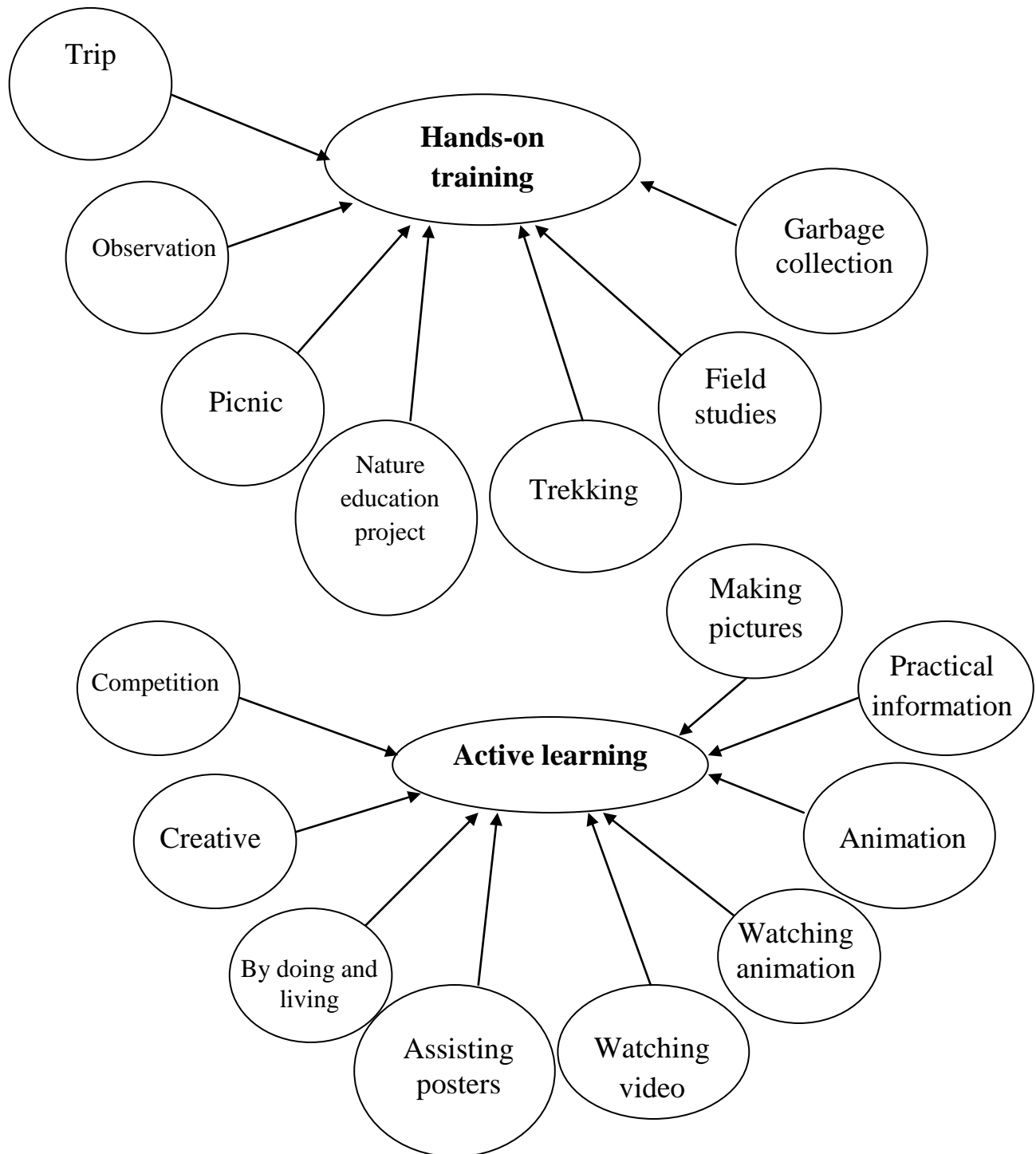
Table 2: The pre-service teachers' responses given to the question "What kind of environmental education do you want to give to your students? Please draw it."

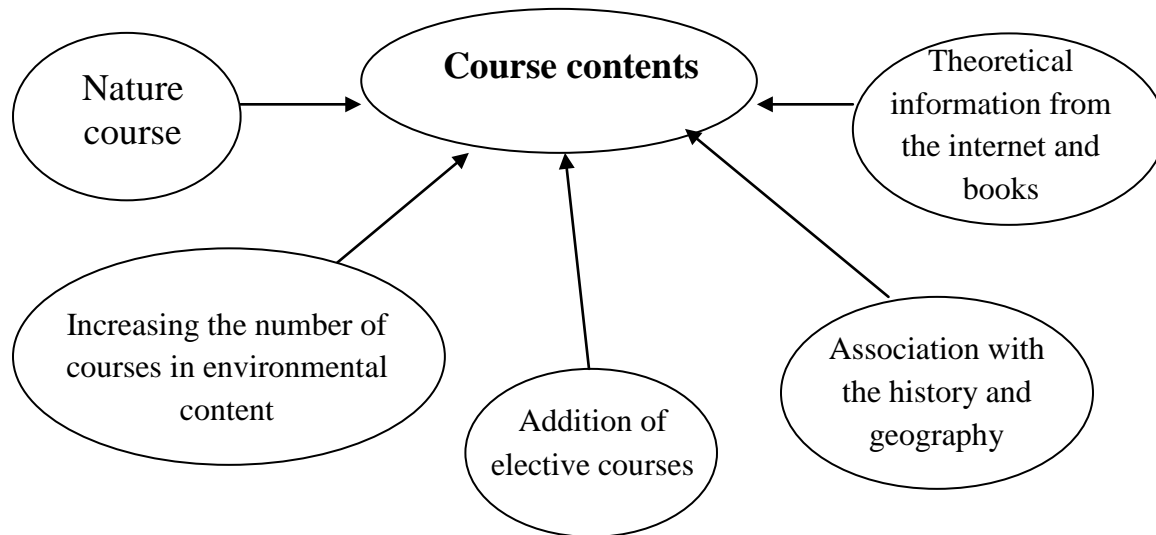
Categories	f	%
Active learning	21	35,59
Hands-on training	17	28,81
Parent training	7	11,86
Content of courses	7	11,86
Pre-school education	4	6,77
Public education	3	5,08

As can be seen in Table 2, the pre-service teachers' responses given to this question "What kind of environmental education do you want to give to your students? Please draw it." before they participated in the nature education project are collected under six categories. Out of these categories, active learning and hands-on training came to the fore.

The cognitive map of the pre-service teachers' responses to the question "What kind of environmental education do you want to give to your students? Please draw it." is presented in Table 2. And the categories presented in Table 2 are visualized in Figure 2. In these cognitive maps, the concepts mentioned by the pre-service teachers in relation to the categories are visualized.

Figure 2: Cognitive map of the pre-service teachers' responses to the question "What kind of environmental education do you want to give? Please draw it."





The Pre-service Teachers' Opinions about Environment and Environmental Education after Nature Education

Following the nature education, the pre-service teachers were asked to draw to respond the first question and then the opinions emphasized in these drawings were separately categorized. Then, the tables of frequency showing how many times each concept was repeated by the students were formed. Then, the conceptualizations of the researchers performed separately were brought together to subsume them under common categories. The data obtained in this way are presented in tables below.

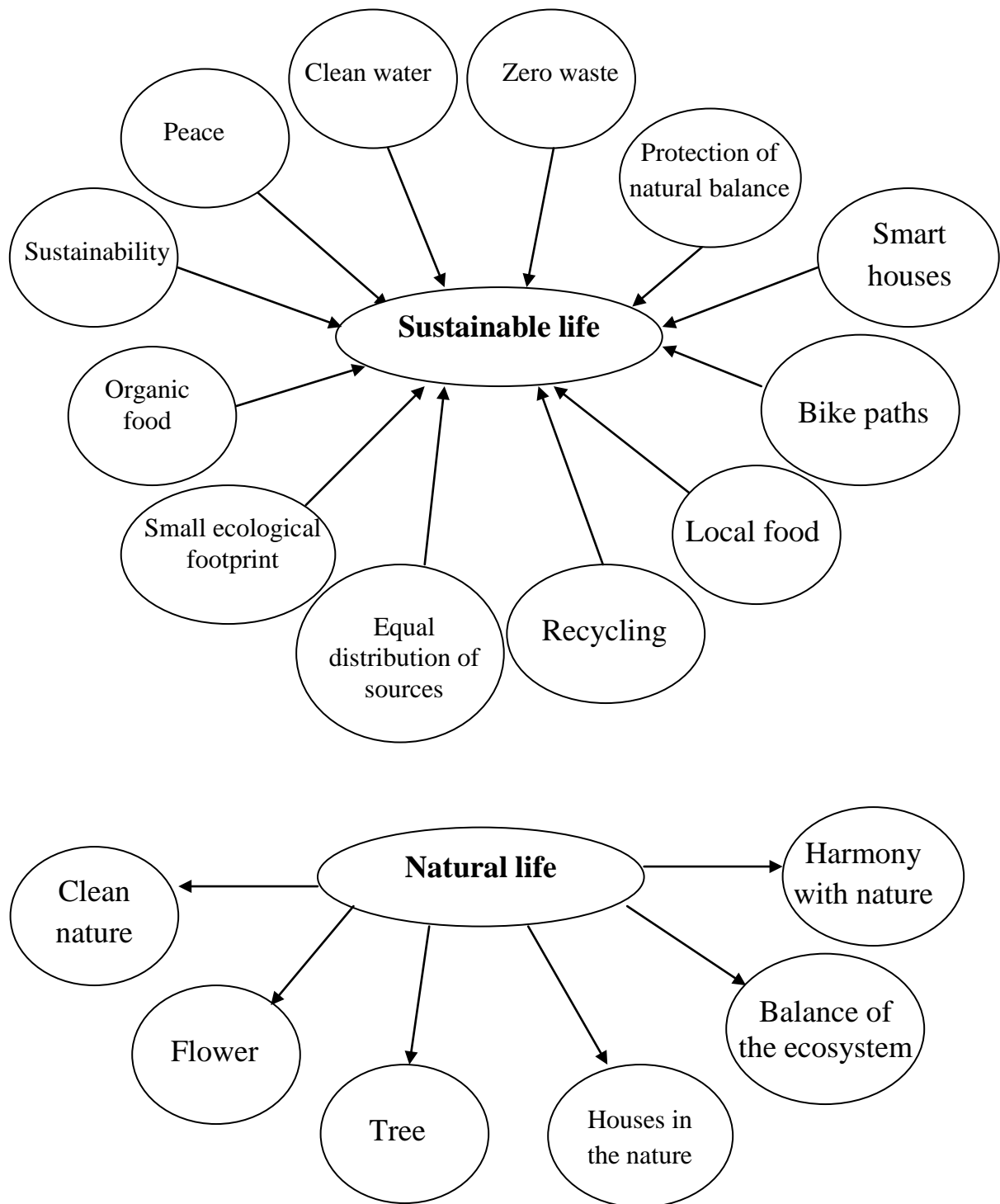
Table 3: The pre-service teachers' responses given to the question "In what kind of environment do you want to live? Please draw it."

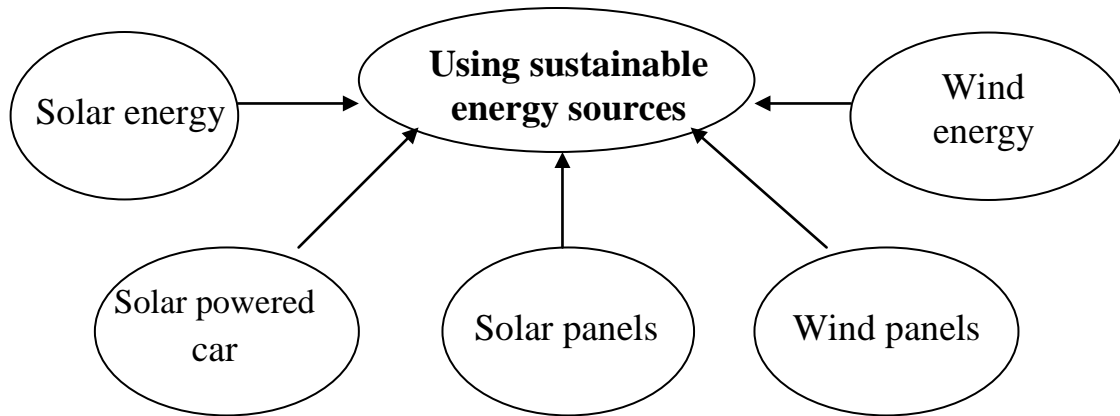
Categories	f	%
Sustainable living	28	45,16
Naturel life	20	32,25
The use of renewable energy sources	14	22,58

As can be seen in Table 3, the pre-service teachers' responses to the question "In what kind of environment do you want to live? Please draw it." after they participated in the project are collected under three categories. Out of these categories, sustainable life and natural life categories came to the fore. Pollution and affective categories emphasized by the pre-service teachers before they participated in the project were not mentioned after the project.

The pre-service teachers' responses to the question "In what kind of environment do you want to live? Please draw it." were collected under categories in Table 3 and they were visualized in Figure 3. The cognitive maps concerning the concepts expressed by the pre-service teachers under the categories of sustainable life, natural life and renewable energy are presented below.

Figure 3: The cognitive map of the pre-service teachers' responses to the question "In what kind of environment do you want to live? Please draw it"





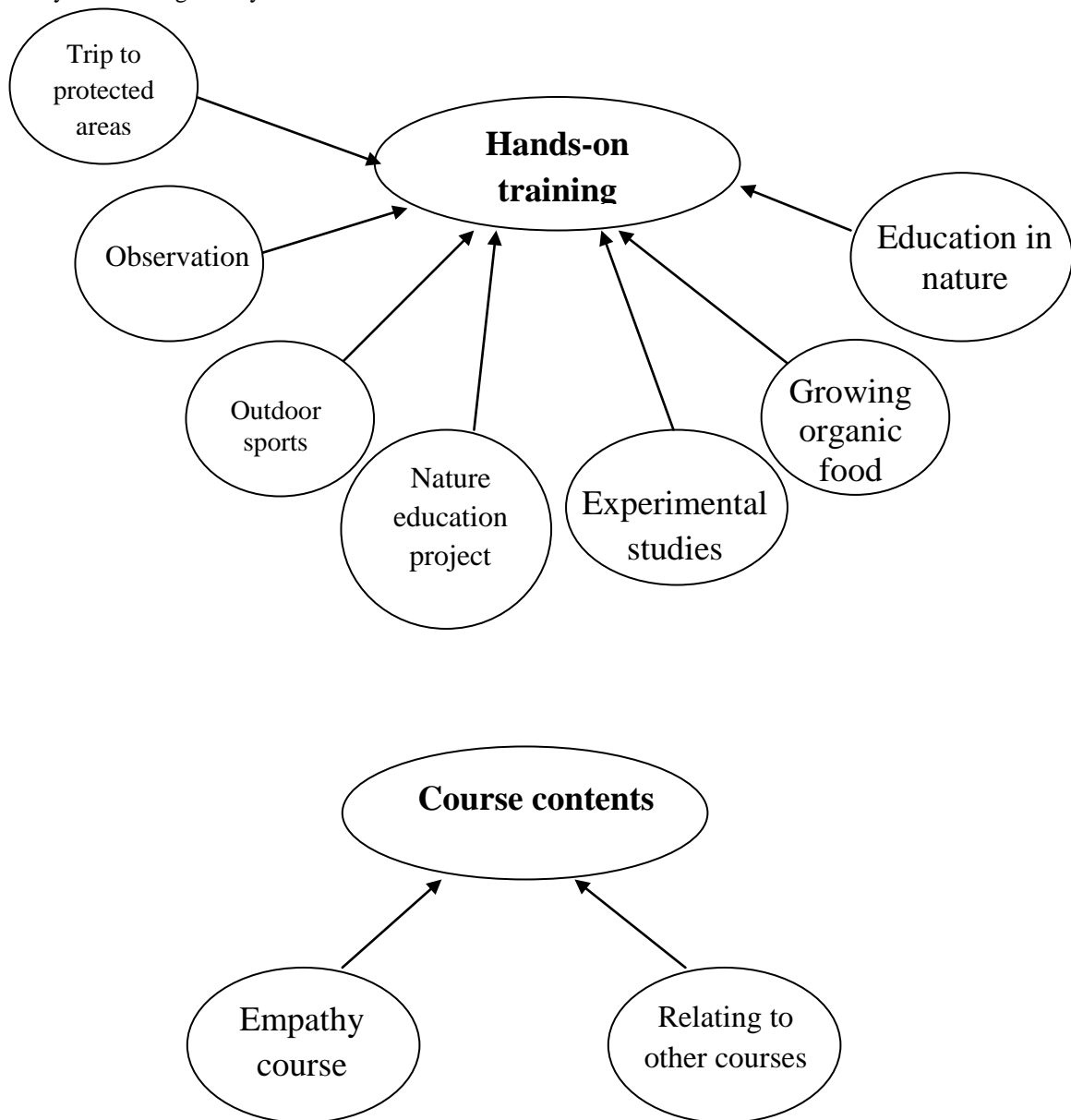
The pre-service teachers' responses to the second question were separately analyzed by the researchers and were put under certain categories. Then, the tables of frequency showing how many times each concept was repeated by the students were constructed. Then, the conceptualizations of the researchers performed separately were brought together to subsume them under common categories. The data obtained in this way are presented in tables below.

Table 4: The pre-service teachers' responses given to the question "What kind of environmental education do you want to give to your students? Please draw it".

Categories	f	%
Hands-on training	28	53,84
Active learning	18	34,61
Contents of courses	4	7,69
Parent training	1	1,92
Public education	1	1,92

As can be seen in Table 4, the pre-service teachers' responses to the question "What kind of environmental education do you want to give to your students? Please draw it." were collected under five categories. Out of these categories, applied education, active learning and course contents categories came to the fore. The pre-service teachers' responses to the question "What kind of environmental education do you want to give your students? Please draw it" were collected under categories in Table 4 and they were visualized in Figure 4. The concepts expressed in the related categories are presented in the following cognitive figures.

Figure 4: Cognitive map of the pre-service teachers' responses to the question "What kind of environmental education do you want to give to your students? Please draw it."



Discussion, Conclusions and Suggestions

It was found that the pre-service teachers' responses to the question "In what kind of environment do you want to live? Please draw it" concentrated on natural life and sustainable life concepts. Under the category of natural life; harmony with nature, balance of ecosystem, free living of animals, respect to living things, trees, seas and clean nature concepts were expressed. Under the category of sustainable life; sustainability, organic nutrients, purifying plants, harmony between technology and nature, recycling, local foods, cycling paths, harmony with nature and state subsidies concepts were expressed. Under the affective dimension, the pre-service teachers mentioned the concepts of utilization of renewable energy resources and pollution. Following the nature education; on the other hand, the pre-service teachers' responses to the same questions were collected under three categories called sustainable life, natural life and renewable energy resources. Different from what emerged prior to the application, under the category of sustainable life, peace, zero waste, small ecologic foot traces and equal distribution of resources were expressed. This shows that the participants' information about the basic principles of sustainable life enhanced after they participated in the study. Under the category of natural life; on the other hand, they mentioned the balance of ecosystem. However, while they mentioned the utilization of renewable energy resources before and after the application, they only focused on wind and solar energy.

It was observed in the pre-service teachers' responses to the question "What kind of environmental education do you want to give? Please draw it.", emphasis was put on the concepts such as active learning, hands-on training, parental education, course contents, pre-school education and public education. Under the category of active learning, the pre-service teachers mentioned organizing competitions, creative drama and learning by doing and experiencing. Under the category of applied education, they mentioned the concepts of field trips, observations, and environmental education projects. Under the category of course contents, they emphasized elective courses and increasing the number of courses with an environmental content. Following the nature education, they repeated the concepts such as applied education, active learning, course contents, parental education and public education. Different from the responses they gave before the study under the category of applied education, they mentioned the concepts of specially protected sites, nature sports, growing organic foods and experimental studies. Under the category of active learning, the concepts of student-centeredness, activity-based and alternative methods and techniques were emphasized. Under the category of course contents, they mentioned the concepts of the course of empathy and relating to other courses.

Following the nature education, the scope of the pre-service teachers' responses to these two questions was expanded. It was found that depending on the education given within the framework of the present study, the pre-service teachers' opinions improved. The concepts expressed by the pre-service teachers in their drawings show that the nature education has increased the participants' knowledge about environment. The findings of many studies carried out on environmental education support this finding. Findings of Benedict (1991) defining active learning as the key to achieving affective, ethical and behavioral objectives of environmental education and those of Ballantyne and Packer (2002) stating that interaction with nature is an effective strategy concur with the findings of the present study. Eaton (2000) stated that learning experiences occurring in open air are better than in-class learning experiences in terms of improving cognitive skills. Keleş, Uzun and Varnacı Uzun (2010) reported that nature education programs have significant influences on people's environmental consciousness, attitudes, and behaviors and enhance retention. Demirsoy emphasized the importance of field works by saying "*field works have resulted in many people becoming scholars. But we have not been able to explain this fact to anybody. We have not been able to make it widespread*" (Yamık, 2006).

In light of the findings of the present study, it is suggested that such projects supported by TÜBİTAK should be expanded and answers should be sought to the question "what type of environmental education should be given?".

Acknowledgements

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