A study on environmental knowledge level of primary students in Turkey

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Abstract

The education system in Turkey has responded promptly to the need for environmental education (EE). However, the existing lack of relevant research may limit the functionality of EE programs in Turkey. In this study, the goal was to develop an environmental conscious database that would allow effective planning of EE. Specifically, the study was conducted to provide information on the environmental knowledge of primary education in a city of Turkey. Standard of living

and environmental knowledge of persons are more important factors that effected for occur of conscious of environment. Therefore, the research must investigate the level of environment knowledge of people according to their living environment and standard. Our study purpose was to determine environmental knowledge level of primary students in Turkey and it was planned to help develop a baseline database that would allow effective planning of Environmental Education for primary education in Turkey. In this research, a case study approach was used, and data gathered with the help of survey method. The research surveyed 524 sixth, seventh and eight-grade students in six schools in the city center, town and village of Trabzon. The results showed that environmental factors are effect children's environmental knowledge level. It is understood that if children are provided with richer environmental and learning material in their live, it would enhance children's environmental knowledge. It must be added some issues as natural environment, basis of life, source of energy, structure of human, pollution of environment to the existing aspects developed in science curriculum at primary level.

Keywords: Environmental Knowledge, Turkey, Primary School

Introduction

Environmental education involves learning about the natural systems that sustain life and how those systems are affected by human activity. Environmental education raises public awareness of the environmental consequences of our actions. During the last decades the trend for environmental protection has expanded in various areas, including the realm of education. The underlying assumptions of this inclusion are that (a) if people are aware of the need for and the ways of protecting the environment they will act to preserve it, (b) schools should assume responsibility for educating about environmental protection, and (c) environmental education (EE) can be effective as a part of a school curriculum. (Paraskevopoulos et.al, 1998). Several educators and environmentalists have produced a rich variety of education models, instructional packages and materials, and theoretical guidelines that have constituted EE. All these efforts have underlined the importance of education in promoting environmental awareness and protection.

Many teachers in high schools develop and apply EE materials and activities. Furthermore, environmentally aware teachers tried to acquire both knowledge and

training in EE (Carre & Carter, 1993). However, few researchers were active in providing the required research base for a scientific approach to the field. The existing lack of research in EE, especially with regard to children in elementary schools, is not only a Turkish phenomenon. Most international studies have focused on the environmental knowledge and education of high school students, leaving the elementary level untouched (Jaus, 1982; Littledyke, 1997) However, the significance of EE is highlighted by research findings suggesting that students at the elementary (Froud, 1994; Gorodetsky, & Keiny 1995) level acquire most of their knowledge about the environment from classes in school. Furthermore, it is becoming evident to all agents involved in EE that the significance of the old idea of building upon the prior knowledge and experience of each student acquires new meaning in the context of EE (Paraskevopoulos et. al, 1998). Walsh (1994) discussed extensively the need to consider the specific local experience of students before EE programs are implemented; the need for local research on environmental knowledge of students has been underlined by other researchers as well.

Situation of environmental education in Turkish education system can be explained in two steps;

1. Primary level. Environmental education issues are presented in lesson of *science and nature knowledge* in nature conservation chapter.
2. Secondary Level. Environmental education lesson is called *Environment and Human* at secondary level in Turkey and it is optional. In addition to environmental education issues to be found in content of biology lesson at K9 level.

There are some difficulties to effective environment education in Turkey. These can be summarized as follows,

1. Explanation inconsistency of goals and principles in preparing education programs,
2. Because of the need for equipments, environmental activities are not practiced,
3. Lack of expert teachers in environmental education.

Government and citizenships have various responsibilities for conservation of environment and prevention of pollution. A reason of current environment problem is

lack of consciousness and information about environment. A person who has not had environmental consciousness might not perceive people lives in the future.

If researches are investigated in literature, it can be clearly seen that however, environment is not heritage, the environment needs to be protected and left for the next generation in its best form. One of the important factors for the environmental education is to define and realize it. (Paraskevopoulos, et.al., 1998; Shin, 2000).

If environmental knowledge of society members has qualified level, they can realize its importance for themselves. It is a positive contribution for environmental education of their living area. When some countries give importance to the environmental education studies (Flogaitis, E., & Alexopoulou, 1991; Paraskevopoulos, et.al., 1998).The development of EE in Turkey has not complied with the above requirements. On the contrary, as in other countries (Ham & Castillo, 1990; Shin, 2000), EE materials used in Turkey are merely translations of foreign ones, resulting in a variety of limitations in their effectiveness. Furthermore, there has not been a large research effort regarding the environmental knowledge of elementary-aged students in Turkey. As a result, interpretations of what students should know or what students do know have not been research based, leaving the issue of EE content unresolved. In these studies the type of settlement area is not taken into consideration. What is the environmental knowledge degree of students educating in city, town and village primary schools in Turkey?

The purpose in this study was to determine environmental knowledge level of primary students in Turkey and it is expected to help development of a baseline database that will allow effective planning of Environmental Education for primary education in Turkey.

Method

In this research a case study approach was used (Bassey, 1999), and data gathered with the help of survey method. The research surveyed 524 sixth, seventh and eigth-grade students in six schools in city center, towns and villages of Trabzon. Trabzon which is located in Black sea area has a population of 250,000. The schools were randomly selected. In each six school of Grade 6, 7 and 8 classes were included in the sample. After this survey was adopted in Turkish, Paraskevopoulos and

co-workers (1998) of survey used in this study. This survey was adapted by researches; this survey translate Turkish and three educational area experts criticized this form and one question was eliminated and total six questions of questionnaire form were given its last form. The first two questions were open ended; and the other four, students were required to make selection from suggested responses. Knowledge about plants, animals, energy, pollution, and the interaction between humans and nature was examined. Data were collected in winter 2003. The questionnaires were group administered in each class by the authors. The teachers were not allowed to help the students.

Findings and Discussion

In this part of study gathered data for each question of the survey are presented with tables. Discussion parts for the data analysis are strictly under the tables.

Plants	City	Town	Village	Total	%
Hazelnut Three	80	68	128	276	17.60
Cabbage	140	150	164	454	28.80
Corn	68	84	126	278	17.70
Flowers	90	112	14	216	13.80
Threes	52	60	48	160	10.10
Romaine Lettuce	68	54	34	156	10.00
Tea Plant	10	12	10	32	2.00
Total				1572	

Table 1. Responses to Question, "Which of These Plants Are Cultivated By People?"

The students named 9 kinds of plants in response to this open-ended question. Plants named most often were cabbage (28.8%), corn (17.7%), hazelnut tree (17.6%), and flowers (13.8%). Other plants were named by the students with frequencies ranging from 10.00% (trees) to 2.00% (tea plants). Students referred mostly to plants that

grow in arable field, and living environment where students have had personal and direct experience. Although cabbage is not mentioned in the textbook of primary level, it is stated by students. In addition to hazelnut tree, it is the same. Effect of living environment on environmental knowledge evidence that *tree and hazelnut tree* concepts expressed separately by students. These plants are special for Black seen geographic area in north of Turkey. For these two cases, we can assume that children's personal experience with plants is related to what they might have been influenced by living environment. Especially most answers of village students are focus on hazelnut tree, cabbage and corn, it is concrete sign of connection between living environment and knowledge environment. One of the important data is limitation of plants species with seven plants by students of samples.

Animals	**City**	**Town**	**Village**	**Total**	**%**
Dog	48	86	40	194	12.36
Cat	34	52	18	104	6.60
Bird	108	76	52	236	15.00
Anchovy	64	76	60	200	12.70
Fish	80	72	68	220	14.00
Specimen	8	28	46	82	5.20
Insects	52	32	68	152	9.70
Cows	44	64	86	194	12.34
Sheep	28	44	68	140	9.00
Goat	2	6	42	50	3.10
Total				1572	

Table 2. Responses to Question "Name Three Animals of Turkey"

Animals named most often in response to this open-ended question were bird (15%), fish (14%), anchovy (12.7%), dog (12.36%), cows (12, 36%), insects (9,70%), and sheep (9.00%). The animals mentioned most often were the pets and animals that

people keep for domestic use. Animals that live free in nature were not mentioned (bear, hog, fox, wolf, rabbit, deer various). Other than anchovy, no fish were mentioned; for goat, cat and specimen were totally ignored. These animals mentioned in textbooks but not known to students directly were not named. Generally, then, students mainly referred to animals known to them directly (pets) and animals used for food (cow, fish, anchovy) but not referred to those used for work (donkey, horse).

	City	Town	Village	Total	%
Oil	90	48	42	180	28.5
Wood	36	50	44	130	20.5
Radiator	14	16	10	40	6.3
Car	22	32	36	90	14.4
Vitamins	92	84	14	190	30.3
Total				630	

Table 3. Responses to Question, "Which of These Are Sources of Energy?"

In this question, students were provided with a list of five choices: oil, wood, radiators, cars, and vitamins. The students responded correctly that oil (28.5%) and wood (46.9%) are sources of energy (Table 3). Important percentage of students (30.3%) selected vitamins as a source of energy. Furthermore, a significant number of students, evidently confusing the source of energy with its use, selected radiators (6.3%) and cars (14.4%). Because of the total percentage of this wrong alternative (car, radiator and vitamins) is very high. it means that students have misconception about source of energy. Especially City and Town student’s data shows that these misconceptions are maximum level in these settlement centers.

	City	Town	Village	Total	%
Humans	108	68	16	192	21.7
Cats	42	26	10	78	8.8
Cars	70	84	80	234	26.5

Noise appliances	56	74	68	198	22.6
Trains	70	64	28	162	18.4
Bicycles	2	6	10	18	2.0
Total				882	

Table 4. Responses to Question, "Which Of These Pollute The Environment?"

Students were asked to select from the following list: cars, people, cats, sound appliances, bicycles, and trains. Cars were selected by almost all the students (26.5%); other common choices were noise appliances (22.6%), humans (21.7%) and trains (18.4%). Only a few students responded that cats (8.8%) and bicycles (2%) cause pollution (Table 4). It is shown that while humans were most selected by student in city, it was least selected by student in village. On the other hand, cars were selected by students. The village students also seldom selected trains probably because they have not seen train (noise, smoke..) and which are not mentioned in their textbooks.

	City	**Town**	**Village**	**Total**	**%**
Agricultural fields	50	28	36	114	19.5
Waterfalls	18	14	4	36	6.1
Canals	18	34	56	108	18.5
Road construction	48	42	42	112	19.1
Buildings	94	52	70	216	36.8
Total				586	

Table 5. Responses to Question, "Which of These Constitute Human Alterations in the Natural Environment?"

Students were asked to select among five choices: agriculture fields, buildings, canals, road construction, and waterfalls. Buildings (36.8%), canals (18.5%), road construction (19.1%), and agriculture fields (19.5%) were selected most often. Only a very small percentage (6.1%) of the students selected the wrong choice, waterfalls

(Table 4). Among those, the village students made the minimum percentage whereas the students of city made the maximum part.

	City	Town	Village	Total	%
Workers	14	22	16	50	8.4
Hunters	152	168	140	460	76.6
Other animals	32	26	22	80	13.4
Farmers	8	2	0	10	1.6
Total				600	

Table 6. Responses to Question, "Which Of These Breaks The Food (Ecological) Chain?"

Students were given four choices: hunters, farmers, other animals, and workers. Almost all (76.6%) students correctly responded that hunters break the food chain; 15.5% of the students responded that farmers break the food chain. Fewer students (13.4%) responded mistakenly that other animals break the food chain. 8.4% responded wrongly that workers (construction and industrial) break the food chain (Table 6). It is clearly that the students were ignorant about the significant impact of farmers on the food chain and the irrelevance of workers and of other animals to the breaking of the food chain. There is no difference between city, town and village data.

Results

The results of this study should be interpreted with caution because our sample was drawn from a medium settlement area only, and this homogeneous sample limits generalizations.

Children are not exactly aware of plant species in their living environment. The evidence is that answers of 564 children were limited with eighth plant species. When look at the plant species selected by children, intensity of plants growing in this region such as hazelnut trees, cabbage and corn attract the most attention. Our results showed that environmental factors affected children's environmental knowledge level. We also

understood that if we provided richer environment and learning material for children in their life, it would enhance children's environmental knowledge.

When answers relevant with animal species are examined, it is seen that animal species increase compare to plants species number. Children's choices mainly concentrated on fish, anchovy and dog. Take into the kind of settlement centers; bird (108) settled in city centers, dog (86) settled in town and cows (86) settled in village are selected. These data show that the most concrete sample of the effect of living environment on environmental knowledge

Children are given wrong answer to question required making selection (4, 5, 6. items) from suggested responses. Over 50% of children's answers (530 answers) of question required to make selection (4, 5, 6. items) are wrong answer. From the data, it was understood that there are deficiency of children knowledge about source of energy. The other important subject that most of the wrong answers given by students in city and town.

First condition for a living world is clears an environment. If students do not have efficiency knowledge about factors that harmed and polluted the environment, they can damage their living environment. On the contrary, they can make contribution for protecting environment. It is positive case that answers the questions concerned this issue is true at important ratio (586/682). These data shows that children in our samples group have efficiency knowledge level about environment pollution.

It is seen that there is a high ratio (534/600) of true answer the question related to factors that harmful for environment. When answers are investigated according to species of settlement centers, there was not clearly difference in city centers, town and village. This data indicated that children are aware of harmful factors for natural environment at considerable grade. Food chain is one of the most important components for natural life. If some factors are interfered on nature, structure of nature can go to bad. As a result imbalance occurs in nature life (OEDB, 1990).

Members of society must be aware of importance of food chain and he is not interfered for this chain. An important ratio (460/600) of answers is focus on role of hunters on breaking the food (Ecological) chain. But children do not aware of negative effects of other harmful factors as farmers and workers. Children do not

select choice of farmers in village. It is thought that these wrong answers resulted from the interference which is a part of their normal life.

Suggestions

Children's (6-12 years) environmental knowledge is positively affected by some arrangements that found in the content of science curriculum at primary level.

There is a need for adding some issues as natural environment, basis of life, source of energy, structure of human, pollution of environment to the existing issues developed in science curriculum at primary level.

Issues of environmental education must be different from theoretical lessons; they must be learned based on interaction and practice. Learned knowledge will be more permanent with this learning method. Since people remember 10% of what they hear, 30% of what they read, 50% of what they see, and 90% of what they do (Gittins, 1988).

Role of children's family is important on environmental education process and environmental education seminars should be arranged for parents.

Children must be understood that nature and society are, in fact (if not in reflection), inseparable (Dennis and Knapp, 1997). In addition, human is a part of biologic life, explain of mean that harmful of by oneself must be present as one of the fundamental goal at education curriculum program. We should develop strategies to encourage students recognizing their environment and paying attention to other components of nature.

Program developers should set clear goals and objectives for the effective EE. EE of programs should improve both the content and the learning methods. Constructivist methods in science teaching will make an important contribution in ensuring that science follows a positive course in the future (Shymansky, 1992). So constructivist methods should be used in environmental education in primary level. In addition to effect of humans on all of the natural components in ecosystem must be learned and the cause and result should be taken into consideration.

It is emphasized that the importance of energy source in educational program in primary level, contributes a positive effect on children's environmental knowledge level where as negative if it is not mentioned efficiently.

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