

Plant and Animal Awareness in Nature Education Perspectives: Where is Blindness?*

Fatma BAKAR

Kastamonu Science and Arts Center, Kastamonu, Turkey

Çağrı AVAN**

Kastamonu University, Institute of Science, Kastamonu, Turkey

Fatih ŞEKER

Küçükçekmece Ortaokulu, İstanbul, Turkey

Bahattin AYDINLI

Kastamonu University, Faculty of Education, Kastamonu, Turkey

Abstract

Awareness as a broad term is subject of many scientific disciplines such as psychology, education and biology etc. Thus the awareness study about our surrounding and environment can be called as a socio-scientific issues. The human species are often in interaction with almost all living and non-living things in the world. And we are not aware about these to some extent. The awareness changes according to the same variables such as mobility, color contrast and similarity to the human being. The living groups (plants and animals) come first rather than non-livings such as stones, water and air. It is the clear that people have higher awareness towards animals. Against plants and mushroom, the awareness is well below the desired level. In this study, it was tried to determine the changes in middle school students' awareness towards animals, plants and mushrooms through nature education. Nature education connects individual with nature. During the education, students recognize livings in the nature and try to understand the importance of nature for a sustainable future. Within the scope of the study, 47 secondary school students were given one week of natural education. Students' answers were analyzed statistically. The pictorial information scales applied before and after the education reveal a significant increase in plant awareness, especially in a world where plant blindness is high.

Keywords: Environment, awareness, nature education, plant blindness, animal chauvinism.

Introduction

Nature, environment and surroundings are frequently used terms in many scientific, social and humanities disciplines. And they are sometimes used interchangeably with each other. Natural intelligence and cognition is also one of the intelligence according to Gardner's theory of multiple intelligences. Intelligence while difficult to define in consensus, is the ability and skill in problem solving. natural intelligence is a step ahead in recognizing the environment surrounding each individual and being aware of their surroundings. Therefore, interaction with the environment is very important both in increasing awareness of the individuals and developing the intelligence of nature. The necessity of increasing the number of people with natural intelligence for an environmental future is a real necessity. As it is seen in Kekeçoğlu et al. (2014) and Tezcan et al. (2010), nature education brings individuals closer to animals, plants, mushroom, insects and other living things and it increases the awareness of the students. As a result, nature education increases environmental awareness.

In broad sense and terms, all the matter, plant, and animals from inanimate to giant objects are made up of atoms. If we go beyond, atoms are made up of proton, neutron in the nucleus and electrons traveling around it. In this perspective, it can be said that

ISSN: 2146-0329

**E-mail: cagriavan@gmail.com

* In this study TUBITAK 4004 Nature Education and Science Schools support program " Ilgaz Dağı Milli Parkında Mikro Alemden Makro Aleme Doğayı Keşfederek Öğreniyorum - 3 " is produced from the Project.

IEJEE
Green

all the things are composed of three particular spherical energetic body in thought. We can further in this fine division to reach leptons in general and some up to date researched tinier energy condensate particles. As the things become smaller the differantion along them become blurred and more sophisticated instruments that have to be used which accommodates high frequency or smaller wavelength light or tinier particle for identification purposes. The similar situation ends with if we go to big units and bodies from atoms to molecules, textures, organelles, cells, tissues, organs, systems and living bodies in various entities and from atoms to solid, liquid and gas matters to planets, stellar systems, galaxy systems and universe. Again, like $-\infty$ and $+\infty$, the universe become without definition due its utter most bigness in thought. In order to define it thoroughly with removing time variable, we need most speed thing that should multiply the speed of light and most gigantic bodies like galaxies that should be controlled under us.

Human as with natural skills have ability to differentiate the things with instruments such as various type microscopes and telescopes, and its natural sensories such as eyes and ears in broad perspectives. Generally, we sustain our daily lives in close environments with our instinct abilities like babies and children. In the natural environment, all the movable and intact objects are in constant interaction. The layer that we all together with plant and animals is called biosphere. Other than the non-living things, the environment is composed of plants and animals which are called as flora and fauna in scientific manner. The mankind who has a place in fauna has deep impact on fauna and flora along with natural non-living matter clusters such as from tiny water fountains to oceans, continents and atmosphere. Also, we have deep awareness about these vast forms which are in close relations. The fungi and protozoa come lack behind the plants and animals. The awareness has been defined and used at various ways. Generally, it has been used as being conscious on the existence of situation, event or object. However, the physical meaning of it is the ability of the differantion from the environment (Kinay, 2013; Özyeşil vd., 2011; Avan vd., 2011). There are two major criteria for occurrence of awareness, one is the object being aware of and the other coconscious being who aware. From the perspective of the object being aware of, the easiest way to distinguish it from its surroundings is to have certain marks and lines, especially in the edges, borders and extremes. Nobody is indifferent to red, pink and bright snow white (Sundberg M.D. et al., 2002). However, whether the color belongs to the object that recognizes or being recognized is a matter of debate. If these colors are dominant over other colors by themselves, they should be normal to be remarkable. Or these colors and boundaries must be attributed to the selective perception of the human in the context of neurophysiological theory.

It will be appropriate to talk about the condition and variability of human awareness of plants and animals. Plants miraculously utilize light at a specific frequency (~ 700 nm) and synthesize many different carbohydrates, proteins and fats at very low temperatures with carbon dioxide and water through very selective light reactions (Wandersee, and Schussler, 2001). The light comes from eight minutes away at the speed of light from a star, the sun a special name given by us. In this case, except for living organisms capable of photosynthesis it has become very clear how much other living things need plants. Hence, plants for people and the world are more important than animals (Çetiner, 2015; Olgunsoy, 2007). Whereas, plants with such a vital importance are generally less recognized by all, especially by students (Çil, 2015). Nonetheless, animals attract more attention and the attraction has a variety of reasons.

The simplest reason for relative animal awareness can be sought in the education system. Unfortunately, the educational system around the world has an animal chauvinist perspective (animal centered) (Balas & Momes 2014, Nyberg and Sanders, 2014). Even in the textbooks, animal paintings and topics are given priority, without

being noticed. Even those who do it are botanical experts. Endangered species of polar bears, pandas and birds of welsh are some famous examples of them. However, there are many endangered plant species and nobody makes a special emphasis on them. In animal awareness there are naturally objective situations specific to humans. First of all, animals are like people in some way, having organs like eyes and ears, being able to make friends with people, as well as posing some kind of potential danger. Another difference between animal and plant awareness is the human attention blindness. The human senses somehow, are bombarded, especially the eyes, and very few of them are undergoing a careful process. The difference between looking and seeing is hidden here. The human brain considers the second stimulus among the same and / or successive stimuli and the stimuli indistinguishable from its environment. to be insignificant. Unfortunately, the indistinctive stimulus turns out to be the plant. Shortly, this is called “plant blindness”. In fact, animals, they are both friends of each other and human in natural life are.

In many studies environmental awareness has been examined in the literature. However, they only contain general lines (Erol, 2016, Saygı, 2016, Berberoğlu, 2015). In the environmental awareness study conducted in the preschool age group, it was identified that the feedback of the students about the animals was higher. It has been determined that plant awareness was not sufficient (Aydın and Aykaç, 2016). There are also many studies in the literature aimed at increasing insect awareness. Through these studies, it has been tried to reduce the prejudices and fears of the individuals (Kekeçoğlu et al., 2014, Tezcan et al., 2010). But the number of studies on plant awareness is very little.

In a research carried on university students studying in the botanical field, it can be said that girls are more sensitive to plants than boys and their awareness is higher. (Fancovicova and Prokop 2011). But plant awareness is far behind animal awareness even in girls. (Allen W. 2003). In a study on secondary school students, it was found out that the preparation of books on interesting plants for the students increased the plant awareness while the arrangement of the trips to the botanical gardens did not affect the plant awareness. Organizing visits to botanical gardens only gives way to positive thoughts for plants (İri Karadeniz, 2017). Agricultural awareness practices are just beginning in our country. With these studies, it is being tried to increase the awareness of individuals towards agriculture and plants (Akgül and Akgül, 2011). Also, the outdoor activities can enhance the awareness, knowledge attitude towards the plants (Fancovicova and Prokop, 2011)

Although we cannot completely change the state of plant awareness, it is thought that it can be modulated by the new book and curriculum design. It is also obvious that extracurricular nature education will contribute to this aim as well. In this study, environmental awareness was approached from micro realm to macro realm as a whole. In the frame of nature education of “I am discovering the nature from microcosms to macrocosms in the Ilgaz Mountain Park” supported by Scientific and Technological Research Institution of Turkey (TUBITAK) It was attempted to instill awareness of plant, animal and mushroom in a certain number and group to the middle school 8th grade students. The level of awareness and the changes in the level of awareness of the students in different socioeconomic conditions according to the species were examined. New routes have been attempted to be formed for future studies. In particular, the points where the technology intersect, overlap and often oppose with natural life, technology has been tried to evolve towards sustainable education through ways of positive transformation.

Methodology

One group pre-test-post-test model was used as the research method (Büyüköztürk, 2017). The study was conducted within the frame of TÜBİTAK 4004 nature education and science schools support program. This training consists mainly of ecology-based nature education that was held in a one-week camp. Within the scope of the training, theoretical and practical activities were carried out by academicians and teachers who are experts in their fields. In the scope of the study, the pictures of the creatures in the fauna and flora of Ilgaz Mountain were given and they were expected to write as open-ended essay in a way that the individual can express themselves directly. Also the pictorial knowledge scale developed by the researchers. The pictorial knowledge test was applied separately before and after the education for collecting information. During the pre-test, the students were informed about the plants and animals in their surroundings, and forest tours were organized to let students see them in their own habitat. After the data were collected, the results were examined using appropriate statistical methods. The data were scored and evaluated as 2 points if the answer is correct, 1 point if it is partially true, 0 point if it was left blank, and -1 point if it is incorrect. The Cronbach Alpha was 0,737 for pre-test and 0,578 for post-test. According to these results, it is seen that the measurement reliability of the test is sufficient.

Study Group

The study group was determined by stratified sampling method (Kılıç, 2013). According to the disadvantages, 23 students from boarding regional schools in Kastamonu province, 6 students from Mercy Houses of Ministry of Family Social Policy, 14 students from central province and 4 students from village schools in central district in Kastamonu province during 2015-2016 academic year respectively were selected. The students selected from the Mercy Houses in the data were evaluated in the central district students.

Table 1.

Distribution of sample by school type and sex

	Girl	Boy	Total
Boarding Schools	13	8	21
Central district Schools	12	8	20
Village Schools	2	4	6

When the demographic characteristics of the participants were examined, 56% were female, 44% were male, 48% were from Regional Boarding Schools, 42% were from central districts and 10% were from village schools.

Table 2.

Distribution according to parents' educational status

	Primary School	Middle School	High Schol	University
Father's Education Level	16	10	10	11
Mother's Education Level	25	8	6	8

As shown in Table 2, 35.4% of the fathers of the students are primary school, 20.8% are middle school, 20.8% are high school and 22.9% are faculties or college

graduates. 54,2% of the mothers of the students are primary school, 16,7% are secondary school, 12,5% are high school and 16,7% are faculty or college graduates.

Findings

In the study, the illustrated plant-animal-mushroom awareness test was applied as pre-test and post-test. The answers given by the students were analyzed statistically. For true, partial and wrong answers 2, 1 and 0 points were ascribed in assessment of the study. In picture 1, the variation of the student answer as a pre-test and post-test were given where in the first answer (a), student just only state the class of the plant (black pine) and takes one point but in the post-test answer (b) also species type (Anatolian black pine) is given and take full point of two.



Picture 1. A sample of student answer

Analysis of Plant Awareness Test

When the results of the plant awareness test were examined, it was found that 8,5104% success was achieved in the pre-test and 56,2941% in the final test. The difference between pre-test and post-test was determined. It can be said that the education given gives the students positive development in the information about plants. In the preliminary test, no one could answer correctly to 2 of the 12 pictures, and all the pictures were less than 50% success rate, however the final test showed that the accuracy of the answers given, except for the "hornbeam, eastern beech and wobbly" pictures, was over 50%.

Table 3.

Plant Awareness pre and post tests t-test results.

Groups	N	X	SS	t	df	p
Pre test	47	-0,24	0,279	-14,567	46	0,000
Post test	47	0,97	0,516			

Table 4.

Plant Awareness pre and post tests frequency table

	Pre Test								Post Test							
	False Answer		No Answer		Partially Correct		True Answer		False Answer		No Answer		Partially Correct		True Answer	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Fir Tree	41	87	4	9	2	4	0	0	10	21	4	9	0	0	33	70
Anatolian black Pine	35	74	2	4	10	21	0	0	3	6	1	2	2	4	41	87
Juniper	11	23	34	72	0	0	2	4	8	17	7	15	0	0	32	68
Pyramidal Orchid	15	32	29	62	3	6	0	0	6	13	4	9	6	13	31	66
Hornbeam	29	62	17	36	0	0	1	2	21	45	16	34	0	0	10	21
Silver linden	6	13	30	64	11	23	0	0	1	2	8	17	26	55	12	26
Pontic Rhododendron	14	30	33	70	0	0	0	0	7	15	10	21	7	15	23	49
Oak	12	26	13	28	13	28	9	19	3	6	10	21	5	11	29	62
Oriental Beech	29	62	17	36	1	2	0	0	16	34	24	51	1	2	6	13
Eurasian aspen	21	45	19	40	7	15	0	0	8	17	18	38	14	30	7	15
Yellow-bee Orchid	10	21	37	79	0	0	0	0	3	6	16	34	4	9	24	51
European ivy	7	15	15	32	25	53	0	0	0	0	3	6	14	30	30	64

When the questions were examined, the biggest difference was seen in the answers given to the picture of "Anatolian big blacks". In the beginning, only 10.64% of the students answered correctly and 89.36% of the students in the final test wrote the correct answer. In the beginning, no one could give a correct answer to the pictures of "Purple forest rose and Bee orchid". In the last test, it can be said that a success in over 50 was achieved in both paintings.

The average of the pictures of "hornbeam, eastern beech and flickering poplar" are also seen to be higher in the post-test. But in these questions, success is less than 50%. Individuals with natural intelligence can easily distinguish such difficult-to-distinguish vegetation, while individuals with underdeveloped natural intelligence have difficulty in doing so.



Figure 1. Plant awareness Pre-test-post-test matrix

When the answers given by the students were analyzed; the above matrix was created using green for exact answers, yellow for acceptable answers, red for incorrect answers, and white for blank answers. When the difference between pre-test and post-test is examined, white areas (blank answers) are on the decrease in the last test side. These students are hesitant to answer questions they do not know. When the change in redness (false answer) is examined, a marked decrease is seen.

Table 5.

The t-test results between the plant awareness pre-test and post testgender

Groups	N	X	SS	t	df	p
Girls	27	0,9630	0,540	-0,159	45	0,874
Boys	20	0,9875	0,495			

It can be determined that there is no significant difference in gender on plant awareness. However, the score for girls in the pre-test higher and contrarily, the results is higher in the post-test for boys.

Table 6.

The results of Anova on the post-test plant awareness with school district

Variance Source	Square Total	sd	Square Averages	f	p
Between Groups	2,032	2	1,016	4,368	0,019
Within Groups	10,233	44	0,233		
Total	12,265	46			

The plant awareness results are significantly different according to school district according to one factor variance analysis. ($F(2-46) = 4,368$, $p < 0,05$). In order to determine in which groups there exist differences Tamhane T2 Post-Hoc test was applied. The results were given in Table 7 accordingly.

Table 7.

The Tamhane's T2 results of plant awareness post-test with school district

School District	School District	Average Difference	Standard deviation	p
Central district Schools	Village School	-0,25833	0,14512	0,258
	Boarding Schools	-,44484*	0,15683	0,022
Village School	Central district Schools	0,25833	0,14512	0,258
	Boarding Schools	-0,18651	0,15758	0,580
Boarding Schools	Central district Schools	,44484*	0,15683	0,022
	Village School	0,18651	0,15758	0,580

When the data is analyzed in terms of school district, there is a significant difference between the students of central district and village schools plant awareness for post-test scores ($F(2,44)=4,368$, $p < 0,05$). At the same time, it can be said that the awareness of the students boarding schools is much better than the other district students. In general, the remediation in awareness is highest in the boarding school students.

Animal Awareness Test Data Analysis

There is a significant difference in animal awareness in comparison of the pre and post tests ($t_{0,05;46}=-12,772$). The children are more successful in post test ($X=1,45$) than the pre one ($X=-0,77$).

Table 8.

The t-test results of animal awareness in pre-test and post-test.

Groups	N	X	SS	t	df	p
Pre test	47	0,77	0,253	-12,772	46	0,000
Post test	47	1,45	0,319			

When the results of the animal awareness test were analyzed, the success of the preliminary test was 54,255% and the final test was 79,6983%. It can be said that the education given gives the students positive development in the information about animals. In the preliminary test, no one could answer correctly to 1 of 12 pictures, it is seen that the success rate in 3 pictures is less than 50%, and in the last test, the answer to all the rest except 2 is over 75% of the accuracy rate. In addition, some animals seem to be known correctly by everyone.

Table 9.

Animal awareness pre and post tests frequency table

	Pre Test								Post Test							
	False Answer		No Answer		Partially Correct		True Answer		False Answer		No Answer		Partially Correct		True Answer	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Bubo	46	98	1	2	0	0	0	0	28	60	0	0	0	0	19	40
Red deer	4	9	2	4	40	85	1	2	0	0	0	0	21	45	26	55
turtle	0	0	0	0	0	0	47	100	0	0	0	0	0	0	47	100
Fox	2	4	0	0	0	0	45	96	0	0	1	2	0	0	46	97
Woodpecker	15	32	10	21	0	0	22	47	5	11	1	2	0	0	41	87
Roe	36	77	2	4	0	0	9	19	7	15	0	0	0	0	40	85
Spider	12	26	6	13	0	0	29	62	3	6	3	6	0	0	41	87
Grizzly bear	0	0	0	0	43	91	4	9	0	0	0	0	22	47	25	53
Wolf	0	0	0	0	0	0	47	100	0	0	1	2	0	0	46	97
Rabbit	0	0	0	0	0	0	47	100	0	0	1	2	0	0	46	97
Black-faced partridge	24	51	13	28	1	2	9	19	6	13	3	6	0	0	38	80
Goshawk	41	87	2	4	0	0	4	9	33	70	1	2	0	0	13	27

When the question is analyzed, the answers given to the picture of "roe deer" are seen to be the biggest difference. In the beginning, only 19.15% of the students answered correctly, while 85.105% answered correctly in the final test. In relation to this picture, it turns out that the students confused roe deer with the deer. In addition, in the beginning, everyone could correctly answer "Wolf and Rabbit" pictures and there was 2.13% decrease in both pictures in the last test. The most important reason for this is the students' dilemma in the face of too many species

"Bubo and hawk" was not sufficiently adopted by the students. Many of the students use the word owl for bubo. But as a result of the training, an important change happens in the error. But it is a bit more difficult to talk about the same situation for a hawk. Because students confuse goshawks with eagles and hawks.

When the difference between the pre-test and the post-test is analyzed, white areas (blank answers) and reds (false answers) decline in the post test. It is understood from the blank answer rates that students do not hesitate to make predictions about animals. When the change in redness (wrong answer) is analyzed, a decline is seen. There is also a reduction in the number of yellows which are considered as semi-true. This means that students make up for their insufficient information.

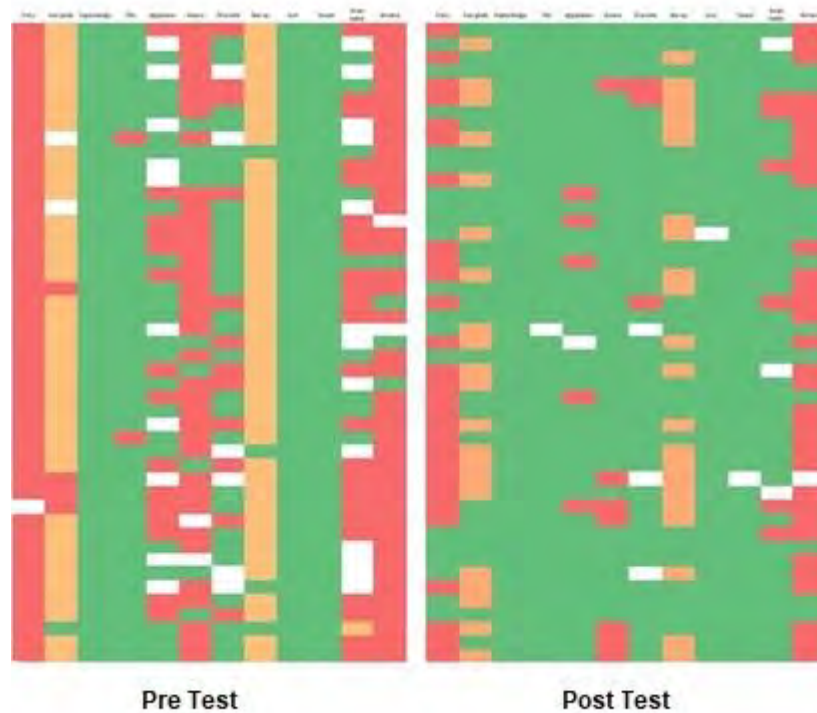


Figure 2. Animal awareness test Pre-test-post-test matrix

There is no significant difference in boys and girls in animal awareness as it can be seen in Table 10. Also, it can be stated that the boys would have been higher score in in both pre-test and post-tests. In the case of school district, significant difference is not obtained.

Table 10.

The t-test results of animal awareness post-test with gender

Groups	N	X	SS	t	df	p
Girls	27	1,398	0,367	-0,269	45	0,211
Boys	20	1,516	0,228			

Analysis of Mushroom Awareness Test Data

There is a significant difference in pre and post tests results on the mushroom awareness ($t_{0,05;46}:-7,713$) (Table 11). The post test result ($X=1,479$) is higher than pre test ($X=0,963$) that shows the effectiveness of nature education.

Table 11.

The t-test results of mushroom awareness in pre-test and post-test

Gruplar	N	X	SS	t	df	p
Ön test	47	0,963	0,325	-7,713	46	0,000
Son test	47	1,479	0,410			

Most of the students have written just mushrooms for mushrooms without considering their differences. However, they have obtained some skills to differentiate the variance in the mushroom species. According to the student responses to the mushrooms, the number of students giving mushroom answer to questions is quite high without telling the difference of species in the preliminary test. But in the final test, it can be said that the students differ in the direction of recognizing the species.

According to the answers given to the questions, the biggest difference is seen in the answers to the "poisonous amanita muscaira" picture. While only 12 % of the students answered correctly at the beginning, 98 % answered correctly in the final test. In the picture of "oyster mushroom", it was determined that students had difficulty in recognizing.

Table 12.

Mushroom awareness pre and post tests frequency table

	Pre Test								Post Test							
	False Answer		No Answer		Partially Correct		True Answer		False Answer		No Answer		Partially Correct		True Answer	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Saffron Milk Cap	0	0	0	0	21	45	26	55	1	2	0	0	0	0	46	98
Morchella conica	1	2	15	32	29	62	2	4	2	4	12	26	7	15	26	55
Oyster Mushroom	2	4	8	17	37	79	0	0	6	13	2	4	35	74	4	9
Amanita muscaria	0	0	12	26	29	62	6	13	0	0	0	0	1	2	46	98



Figure 3. Mushroom awareness test Pre-test-post-test matrix.

When the difference between pre-test and post-test is examined, yellow parts (partial right) on the last test side declines. It is a sign that these students have a general knowledge of mushroom. Students learn about mushrooms as they accumulate knowledge. Initially the reds have multiplied after a while. It may be due to misconceptions.

Girls have higher average in mushroom awareness pre-test and post-test (Table 13). However, there is no significant difference between them. The nature education does not make them differentiate. Also, the school district does not differentiate the mushroom awareness.

Table 13.

The t-test results of mushroom awareness post test with gender

Groups	N	X	SS	t	df	p
Girls	27	1,537	0,384	1,137	45	0,262
Boys	20	1,400	0,439			

Conclusion and Discussion

The flora and fauna formed with plants and animals are inevitable components of our planet. Also, the non-living parts of the Earth mainly in solid, liquid and gas forms are also enriched with plants and animals from single cell to higher order species. Therefore, the differentiation among them have prime importance in increasing knowledge for conservation of environment. The children have natural curiosity and tendency to explore the environments and surrounding. Mostly, this type behavior become lose with increasing age of the people. It becomes a professional job. Therefore, nature education should be started as soon as possible accordingly with child growth to reach permanent habits. In the study, it was tried to reveal how ecology-based nature education led to a change in students' awareness of plants, animals and mushroom. For this purpose, the scales of plants, animals and mushrooms seen during the training were applied to students as pre-test and post-test. First of all, it can be declared that before nature education and activities students cannot differentiate some basic plants. Instead, they state the part of the plants such as leaf, tree and flower. This means that they have some general and smattering knowledge on plants without differentiating the species variation of them. With the help of nature education, they stop revealing general rephrasing and giving conscious answer which state their awareness of the species variation of plants. In addition, they have both corrected their misconception and gave answer more questions. This remediation can be seen more comprehensively and easily where yellow and red zones becomes more green i.e. they have corrected their answer and blank (white) zone also is filled with green i.e. they have answered more questions. The development level of boarding school students in plant awareness is higher than the other school districts. In one of the study, İri Karadeniz (2017) have contrarily found that the scientific trip to botanic park has no effect the plant awareness of the students. This can be attributed to that botanic park is artificial place for the plants in which the motivation of the students may lack behind the natural places where education about environment given.

In the case of the animal awareness, the test results revealed that the students were able to distinguish 50% of the animals initially. During the education period, an improvement was observed in the individuals. When the animal awareness matrix is examined, it can be said that the students have gained more information about animals with education. But they responded to all of item questions without thinking that they would be right or wrong. They did not hesitate to answer these questions. When examined in terms of the school district, it was determined that the awareness of the students in the village schools is better. As a result of the education, it was determined that the most progressed students were the ones in the schools in the city center. In terms of animal awareness, it is seen that children living in the city center do not know the animals around. It is necessary to prepare environments in which the students interact with living beings. Similar to the results, in the study by Allen W. (2003), it is seen that the animal awareness of the students is higher than the plant awareness.

When the results were examined in terms of mushroom awareness, better results or the better change ratio were obtained than plants. Students are better acquainted with mushrooms. These results are better seen when the mushroom awareness matrix is examined. Students are more aware of mushrooms. But in the preliminary test, very good progress has been made as a result of education, even though they do not know the exact names of the mushrooms. When the results are analyzed in terms of the school district, it is seen that the awareness of the students in boarding schools is higher.

As a result, nature education brings individuals closer to animals, plants, mushroom, insects and other living things and it increases the awareness of the students.

• • •

References

- Akgül, H. C., & Akgül, E. M.(2011). Fen Eğitiminde Yeni Bir Kavram: Tarımsal Farkındalık. *Sakarya Üniversitesi Eğitim Dergisi.*, 1(1), 15-25.
- Allen, W. (2003). Plant blindness. *AIBS Bulletin*, 53(10), 926-926.
- Avan, Ç., Aydın, B., Bakar, F., & Alboga, Y. (2011). Preparing Attitude Scale to Define Students' Attitudes about Environment, Recycling, Plastic and Plastic Waste. *International Electronic Journal of Environmental Education*, 1(3).
- Aydın, Ö., & Aykaç, N. (2016). Yaratıcı Drama Yöntemi ile Verilen Eğitimin Okul Öncesi Öğrencilerinin Çevre Farkındalığına Etkisi. *Yaratıcı Drama Dergisi*, 11(1), 1-16.
- Balas, B., & Momen, J. L. (2014). Attention “blinks” differently for plants and animals. *CBE-Life Sciences Education*, 13(3), 437-443.
- Berberoğlu, E. O. (2015). Ekopedagoji Temelli Sınıfdışı Çevre Eğitiminin Çevre Farkındalığı Üzerinde Etkisi. *Hasan Âli Yücel Eğitim Fakültesi Dergisi*, 12(1), 67-81.
- Büyüköztürk, Ş. (2017). Sosyal bilimler için veri analizi el kitabı. Ankara: Pegem Akademi.
- Büyüköztürk, Ş. (2012). Örneklem yöntemleri. <http://w3.balikesir.edu.tr/~msackes/wp/wp-content/uploads/2012/03/BAYFinal-Konulari.pdf> adresinden 25.08.2018 tarihinde indirilmiştir).
- Çetiner, S. (2015). Bitkiler ve insanlar. *Tarla Sera Dergisi*, 5 (63), 24-26.
- Çil, E. (2015). Integrating Botany with Chemistry & Art to Improve Elementary School Children's Awareness of Plants. *The American Biology Teacher*, 77(5), 348-355.
- Özyeşil, Z., Arslan, C., Kesici, Ş., & Deniz, M. E. (2011). Bilinçli farkındalık ölçeği'ni Türkçeye uyarlama çalışması. *Eğitim ve Bilim*, 36(160).

- Erol, A. (2016). Proje yaklaşımına dayanan aile katımlı çevre eğitimi programının 5-6 yaş çocuklarının çevreye yönelik farkındalık ve tutumlarına etkisinin incelenmesi. Pamukkale Üniversitesi, Eğitim Bilimleri Enstitüsü Yayınlanmamış yüksek lisans tezi.
- Fancovicova, J., & Prokop, P. (2011). Plants have a chance: outdoor educational programmes alter students' knowledge and attitudes towards plants. *Environmental Education Research*, 17(4), 537-551.
- İri Karadeniz, F. G. (2017). Bitkiler hakkında kitap hazırlama ve botanik bahçesi gezisinin altıncı sınıf öğrencilerinin bilgi farkındalığı üzerine etkisi. Muğla Sıtkı Koçman Üniversitesi, Eğitim Bilimleri Enstitüsü. Yayınlanmamış yüksek lisans tezi.
- Kekeçoğlu, M., Rasgele, P. G., Akıllı, M., ve Kambur, M. (2014). Sürdürülebilir çevre için arı farkındalığı yaratılmasında "arı biziz bal da bizdedir" projesinin yeri. *Uludağ Bee Journal*, 14(2), 74-87.
- Kılıç, S. (2013). Örneklemeye yöntemleri. *Journal of Mood Disorders*, 3(1), 44-6.
- Kınay, F. (2013). Beş boyutlu bilinçli farkındalık ölçeği'ni türkçe'ye uyarlama, geçerlik ve güvenirlik çalışması (Master's thesis, İstanbul Bilim Üniversitesi, Sosyal Bilimler Enstitüsü.).
- Nyberg, E., & Sanders, D. (2014). Drawing attention to the 'green side of life'. *Journal of Biological Education*, 48(3), 142-153.
- Olgunsoy, B. (2007). Balıkesir yöresinden derlenmiş bitki ve hayvanlarla ilgili inanış ve uygulamalar üzerine bir araştırma (Yayınlanmamış Yüksek Lisans Tezi). Balıkesir Üniversitesi Sosyal Bilimler Enstitüsü, Balıkesir.
- Saygı, S. (2016). Çağdaş Sanatta Doğa Algısı ve Ekolojik Farkındalık. *Sanat - Tasarım Dergisi*, 1(7), 7-13. Retrieved from <http://dergipark.gov.tr/marustd/issue/30399/328263>
- Sundberg, M., Antlfinger, A. E., Ellstrand, N. C., Mickle, J. E., Douglas, A. W., & Darnowski, D. W. (2002). Plant Blindness: "We Have Met the Enemy and He is Us. *Plant Science Bulletin*, 48(3), 78-124.
- Tezcan, S., Tezcan, F., Gülerperçin, N., Karababa, A. O., Üzüm, A., & Kanlıoğlu, A. (2010). Toplumda Böcek Farkındalığı Yaratılmasında BÖFYAP Projelerinin Yeri. *Biyoloji Bilimleri Araştırma Dergisi*, 3(1), 101-106.
- Wandersee, J. H., & Schussler, E. E. (2001). Toward a theory of plant blindness. *Plant Science Bulletin*, 47(1), 2-9

Doğa Eđitimleri Kapsamında Bitki ve Hayvan Farkındalığı: Körlük Nerede?

Fatma BAKAR

Kastamonu Science and Arts Center, Kastamonu, Turkey

Çađrı AVAN*

Kastamonu Assessment and Evaluation Center, Kastamonu, Turkey

Fatih ŐEKER

Küçükçekmece Ortaokulu, İstanbul, Turkey

Bahattin AYDINLI

Kastamonu University, Faculty of Education, Kastamonu, Turkey

Özet

İnsanođlu yaşadığı evrende neredeyse tüm canlı ve cansızlarla etkileşim içerisindedir ve bütün bunlara olan farkındalığımız aynı boyutta değildir. Farkındalığımız çeşitli değişkenlere göre değişim göstermektedir ki bunların bazıları; hareketlilik, zıt renkler ve insana benzerlik olarak söylenebilir. Canlılara karşı gösterilen farkındalıkta karşımıza çıkan ilk canlı grupları hayvanlar ve bitkilerdir. İnsanların hayvanlara karşı farkındalıklarının daha yüksek olduğu bir gerçektir. Bitki ve mantarlara karşı ise bu farkındalık istenilen seviyede değildir. Bu çalışmada ortaokul öğrencilerinin doğa eğitimleri ile hayvan, bitki ve mantar farkındalıklarındaki meydana gelen değişiklikler belirlenmeye çalışılmıştır. Doğa eğitimleri bireyi doğa ile bütünleştirmeyi amaçlamaktadır. Bu eğitim süresince öğrenciler doğadaki canlıları tanımakta, sürdürülebilir bir gelecek için doğanın önemini anlamaya çalışmaktadırlar. Çalışma kapsamında 47 ortaokul öğrencisi bir haftalık doğa eğitimine alınmıştır. Öğrencilerin verdiği cevaplar istatistiksel olarak analiz edilmiştir. Verilen eğitimin öncesi ve sonrasında uygulanan resimli bilgi ölçekleri doğa eğitimi sayesinde özellikle bitki körlüğünün yüksek olduğu bir dünyada, bitki farkındalığında önemli bir artış olduğunu ortaya çıkarmaktadır.

Anahtar Kelimeler: Çevre, farkındalık, doğa eğitimleri, bitki körlüğü, hayvan şovenliği.