

Science and Technology Teachers' Opinions Regarding the Usage of Zoos in Science Teaching

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ABSTRACT

In this study it was aimed to investigate the science and technology teachers' opinions regarding using zoos which are one of the out of school learning environments, as an educational resource in science teaching. For this purpose, a qualitative data was obtained by semi-structured interviews in order to resolve the problem. Study group which was selected with purposeful sampling strategy was composed 36 science and technology teachers who works in Gölcük which is a district in the province of Kocaeli. The study was conducted in 2011-2012 academic year. In this study as a data collection instrument, semi-structured interviews were conducted with teachers in order to obtain their conceptions regarding the current status of zoos in science teaching. For analysis of data collected through semi-structured interviews, content analysis technique was used. As a result of interviews conducted with teachers, it was emerged teachers can benefit from zoos in education and training activities that are related to science and technology course curriculum. Meanwhile, they have stated the contribution of zoos to education by emphasizing the positive effects of zoos on students' cognitive and affective characteristics. The results of this study in which science and technology teachers' opinions were evaluated, presented findings regarding the usage of zoos as an educational resource to promote science teaching in Turkey and contributed to the literature.

Keywords: *Zoo, Teachers' Opinions, Out Of School Learning, Science Teaching*

INTRODUCTION

Necessities of societies, becoming more complex due to the advancement of industrialization and technology day-by-day, have increased. Apprenticeships and similar trainings used the old system could not be sufficient to prevent this confusion. Thus; a concept called "modern school" was created, containing of people specialized in certain areas, providing education in an organized and systematic manner under the supervision of the government (Eskicumalı, 2005). However; an individual is in interaction with his/her environment as of the day he/she is born. As a result of this interaction, various learnings occur automatically within life itself (Laçin Şimşek, 2011). Consequently; learning is not only a process carried out within school limits by students and teachers under a certain program. This way, the concept of informal education was created, meaning the total of all activities that the individuals experience throughout their lives without planning (Gerber, Marek and Cavallo, 2001). Therefore, to bring up individuals with certain qualities, informal education must be mentioned as much as formal education (Balkan Kiyıcı and Atabek Yiğit, 2010).

Today, especially because information and technology are concepts that renovate and improve themselves everyday; Science and Technology education is essentially important among the training and education activities for bringing up the individuals required by societies (Tan and Temiz, 2003). In this frame; it is very important to bring up

individuals, who follow scientific and technologic developments, who understand the natural world, who use science against the problems he/she faces, who carry-out scientific processes and thus have the ability to structure information, who value the society and environment he/she lives in, and who is literate in science and technology (MEB, 2005). To achieve these goals; although formal education is carried out in a programmed manner inside classrooms, informal education is also used next to it. This way; learning environment is taken out of the traditional classroom environment, the attention of the student is drawn and the attitude of the students towards the lesson is changed by creating curiosity, by having them face real world problems and having them gain new experiences on their own. So, as in the basic philosophy of constructivist approach; students construct the learning process at their own paces, in accordance with their own learning style, in a manner to facilitate their learning, and by using their sense organs (Winston, 1995 akt. Dori and Tal, 1998; Melber and Abraham, 1999). This way; with the teaching and learning activities at institutions and environments performed outside the physical boundaries of the school building in parallel with the educational program, the individual interacts with the concepts and objects in science topics and has full and meaningful learnings (Ramey-Gassert, 1997, Hannu, 1993). In the frame of these aims; usage of out-of-school learning environments such as science educations zoos, museums, botanic gardens, planetariums, science centers increase everyday and gets the attention of science educators (Smith, McLaughlin and Tunncliffe, 1998).

Many social areas around the individual can be named as out-of-school learning environments. At this point; zoos are the most important sources, whose educational values are increasing every day, regarding the topics related to animals covered in Science and Technology Lessons. Zoos are pleasant and entertaining exhibition areas; where animals and their natural habitats are shown, that bring people and animals face to face, that create changes in the existing information and attitudes of people (Falk, Reinhard, Vernon, Bronnenkant, Heimlich and Deans, 2007). Using zoos in a planned and programmed manner in educational activities in line with the aimed acquisitions of the lesson will allow students to improve various skills in cognitive, affective and psychomotor areas (Randler, Baumgärtner, Eisele and Kienzle, 2007). In such environments, students solidify the knowledge they get in science and technology lessons in an abstract and oral method, use various sense organs and different learning styles, and learn the events and facts in science by "doing and living" (Laçin Şimşek, 2011). At the same time; science topics delivered at zoos, being different from formal education environments, draw the interest and attention of students, and affect their attitudes towards the lesson and species (Lukas and Ross, 2005; Randler, Baumgärtner, Eisele and Kienzle, 2007). In addition to these; their interaction with peers and active participations during such activities will affect their communicative and social skills and confidence (Pace and Tesi, 2004). Activities with participations to be organized at zoos will improve various psychomotor skills of students. Therefore; the amount and importance of these learning environments among training-education activities increase day-by-day. This makes it necessary for teachers to be aware of the zoos, as being one of the out-of-school learning environments, and the effect of these environments to learning. Finding out the problems faced by teachers, who are the conductors of such activities, and their opinions for removing these problems, will reveal how teachers perceive zoos as out-of-school learning environments. At the same time, although zoos are often seen to be used for science education as out-of-school learning environments in developed countries, they are not used in science education at the desired level in Turkey. Studies in Turkey, related to out-of-school learning environments, generally include museums, science centers and nature educations. Extensive studies that define the position and importance of zoos are rarely seen in the literature. Due to these reasons, this study aims to put forward the opinions of Science and Technology teachers, regarding zoos as out-of-school learning environments.

METHOD

This research is a qualitative study made for acquiring the opinions of Science and Technology teachers, regarding usage of zoos as out-of-school learning environments in educational processes, through semi-structured interview technique.

STUDY GROUP

Research study group consists of 36 science and technology teachers (24 Women and 12 Men), who carry out science and technology lessons in Gölcük county of Kocaeli province during 2011-2012 educational year. To select this group, purposive sampling method was used. The reason is that purposive sampling allows detailed and in-depth studies of groups rich in terms of knowledge (Yıldırım and Şimşek, 2011). The study was carried out with teachers working in Gölcük because this county is a center near many institutions that can be regarded as out-of-school learning environments.

DATA COLLECTING TOOL

Regarding the usage of zoos in science education, semi-structured interviews with science and technology teachers were used as data collecting tools in this study. The interview is the data collection technique through verbal communication for a certain purpose (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz and Demirel, 2008). Among them, the interviews can be examined based on classifications of interview purpose, interview participant number, the person desired to be interviewed and finally, the strictness of the interview rules (Karasar, 2007). Among interview types, semi-structured interview technique was used to create an answer for the problem in research.

While preparing the semi-structured interview forms for this research, relevant literature was also scanned. After scanning, first, the topics were defined in the second stage, and a pool of articles was created to include the questions related to these topics. At the third stage; appropriate semi-structured interview questions were chosen, drafts were created, and expert (3 Science Educators) opinions were taken. Necessary corrections were made and incomplete sections were organized. In this context; interview forms related to zoos, consisting of 7 questions, were prepared for Science and Technology teachers. Interviews were recorded by voice recorders in accordance with consents from teachers, and analyzed later.

DATA ANALYSIS

In the Research, content analysis was made to analyze the data acquired from interviews with teachers. The purpose in content analysis is to arrange, conceptualize, and interpret under a certain concept and theme topic the data that are similar and related among the gathered data. The data with content analysis are gathered in 4 stages (Yıldırım and Şimşek, 2011). At data coding stage; the data written down and organized by the researcher are divided into meaningful sections and researchers try to find out what each section means conceptually. Created sections are defined by codes (Creswell, 2003). At theme finding stage; because classification of the data acquired from codes is not sufficient, it is necessary to find themes that can gather these codes under certain categories (Şencan, 2005). At the stage of organizing the data according to codes and themes; coded and themed data are organized and brought to a format and language that the reader can understand. In the stage of interpreting the findings; various assumptions are made from acquired findings and data are given meanings by establishing certain relations (Yıldırım and Şimşek, 2011).

Regarding the usage of zoos in science education; first, 50 to 60 minute semi-structured interviews were made with science and technology teachers. Then, records of these interviews were listened by the researcher one by one, and each word uttered by the participants have been transformed into written documents exactly as the same. First, codes were defined for these gathered data; then, themes were created grouping similar codes under same titles, and necessary arrangements and definitions were made. Finally; presented findings were interpreted by researchers.

FINDINGS

The findings from the interviews with teachers are given in this chapter.

Table 1 gives the teacher opinions for the research question “What do you think about zoos?”, which had been asked to teachers during the interviews.

Table 1. Opinions of Teachers about Zoos

Data Source	Theme	Code	Teachers	Frequency (f)	Percentage (%)	
on Zoos	Learning	Permanent Learning	T1	1	1.30	
		Learning by Using the 5 Senses	T1, T3, T19, T22, T32, T36, T13	7	9.09	
		Students need to see	T5, T10, T17, T22, T24, T25, T33, T35, T36	9	11.69	
	Characteristics of the Environment	Open to Public	T2	1	1.30	
		Containing animal species	T7, T12, T14, T16, T31	5	6.49	
		Educating	T21	1	1.30	
		Entertaining	T4, T16, T34	3	3.90	
		Contains animals we haven't seen before	T1, T6, T10, T16, T27, T28, T29, T34	8	10.39	
		Love for Humans-Animals	T3, T11, T35	3	3.90	
	Influences to Students	Point of Views	T15	1	1.30	
		General Culture	T14	1	1.30	
		Making Observations	T3	1	1.30	
		Curiosity	T6	1	1.30	
	Contribution to Science and Technology Lesson	The Topic of Reproduction, Growth and Development in Animals	T1, T3, T11	3	3.90	
		Ecosystem	T12	1	1.30	
		Habitats	T12, T13, T22, T24, T30, T32, T36	7	9.09	
		Assists Science Lesson	T23, T36	2	2.60	
		Characteristics of Animals	T15, T20, T32	3	3.90	
		Cycle of Life	T26, T30	2	2.60	
		Purpose of Going	to See Different Animals	T2, T4, T8, T20, T31	5	6.49
			to Gain Knowledge about Animals	T9, T13, T14, T36	4	5.19
			to See Animals in-Flesh	T15, T22, T32, T36	4	5.19
			to Know Animals	T16	1	1.30
	to See All Animals		T18, T21	2	2.60	
	to Learn about Animals We Do Not Know		T27	1	1.30	
	Total				77*	100

*Frequency of teacher statements

Examination of teacher statements in Table 1 reveals that teachers generally relate zoos with the characteristics of the zoos environment. Although characteristics of zoos come forward at first in teachers' statements; in some of the opinions, connections were made between zoos and topics in science and technology lessons. Despite this, the dimension related to learning was not highlighted in teachers' statements.

Some direct quotes from teacher interviews;

“...It is an educative place....”(T21)

“... but they are kept apart a little, at least to see; it is very necessary for them to closely see their habitats.”(T22)

Table 2 gives the teacher opinions for the research question “**Can there be a relationship between zoos and Science & Technology lessons?**”, which had been asked to teachers during the interviews.

Table 2. Opinions of Teachers Concerning Relationship between Zoos and Science & Technology Lessons

Data Source	Theme	Code	Teachers	Frequency (f)	Percentage (%)	
Link between Zoos and Science & Technology Lessons	Topics and Units of Science and Technology Lesson	Reproduction Manners	T3, T4, T6, T7, T13, T14, T17, T19, T20, T22, T30	11	12.5	
		Habitat	T5, T7	2	2.27	
		Ecosystem	T7, T12, T17, T29, T34	5	5.68	
		Reproduction and Growth in Plants	T6, T34	2	2.27	
		Food Pyramid	T20, T25, T33, T34	4	4.55	
		Classification of Species	T25, T32, T35	3	3.41	
		Species and Life	T28	1	1.14	
		Cycles of Materials	T34	1	1.14	
		Adaptation	T30	1	1.14	
		Baby Care	T3, T11, T14	3	3.41	
		Cycle of Life	T3	1	1.14	
		Reproduction, Growth and Development in Animals	T3, T5, T6, T7, T9, T10, T12, T13, T17, T18, T19, T22, T27, T31, T33	15	17.05	
		Species and the World	T1	1	1.14	
		Vertebrates	T13, T15	2	2.27	
		Physical Characteristics of Animals	T7	1	1.14	
	Animal Species	T9, T26	2	2.27		
	Natural Habitats of Animals	T26, T30, T35	3	3.41		
	Anatomic Structures	T35	1	1.14		
	Feeding	T15, T21, T25, T35	4	4.55		
	Assistance to Science and Technology Lesson	about Species	T2	1	1.14	
		about Biology	T5, T23, T26	3	3.41	
		about Natural Science	T16	1	1.14	
		Assists Learning about Animals	T4, T5, T8	3	3.41	
		about Science and Technology Program	T1, T24, T29	3	3.41	
		Learning by Seeing	T3, T4, T9, T11, T12, T13, T15, T19, T22, T23, T26, T32	12	13.64	
		Providing Ready Environment for Science	T2, T36	2	2.27	
		Total			88*	100

*Frequency of teacher statements

Examination of teacher statements in Table 2 reveals that most teachers relate zoos with Topics and Units of Science and Technology Lesson. Teacher statements show that they usually list the science and technology lesson units and topics, which are related to educational activities that can be carried out at zoos.

Some direct quotes from teacher interviews;

"Of course, because we have units in science program related to species and the world..."(T1)

"Yes, of course, science is a branch engaged in both living and non-living things. And I think that on the living things part, zoos are environments fully ready for science..." (T2)

Table 3 gives the teacher opinions for the research question "Why do you think that a zoo is an out-of-school learning environment in Science & Technology lessons?", which had been asked to teachers during the interviews.

Table 3. Opinions of Teachers Concerning Zoo being an Out-of-School Learning Environment

Data Source	Theme	Code	Teachers	Frequency (f)	Percentage (%)	
Zoo being an Out-of-School Learning Environment	Assists the Lesson	Related to the Topics in the Lesson	T2, T3	2	2.35	
		Provides Opportunity to Observe Relations between Species	T2, T16, T23, T25	4	4.71	
		Can be Associated to Units Related to Animals	T4, T9, T11, T12, T13, T16, T18, T20, T22, T23, T24, T24, T25, T27, T31, T32, T33, T34, T35, T36	21	24.71	
		Provides Opportunity to Establish Relations with Daily Life	T5	1	1.18	
		Aims of Science Lesson	T10, T31, T32, T33	4	4.71	
		Assists Science Lesson	T16, T20, T23, T28, T35	5	5.88	
		Solidifies Abstract Information	T27, T29	2	2.35	
		Knowledge Reinforcement	T35	1	1.18	
		Provides Perspective	T1	1	1.18	
		Love for Animals	T1	1	1.18	
	Provides Change in Students	General Culture	T1, T17, T33	3	3.53	
		Seeing animals that they have not seen before	T1, T20, T22	3	3.53	
		Feeding Animals	T1	1	1.18	
		Observation Skill	T2, T3, T9, T19, T20	5	5.88	
		Prevents Forgetting	T9	1	1.18	
		Curiosity	T10, T15	2	2.35	
		Learning by Using the 5 Senses	T6, T12, T14, T15, T16, T17, T18, T20, T27, T29	10	11.76	
		Learning by Doing and Living	T8, T9, T19	3	3.53	
		Learning	One-on-One Learning	T9	1	1.18
			Easy Learning	T18	1	1.18
	Permanent Learning		T34	1	1.18	
	Giving Meaning to the Unit		T13, T35	2	2.36	
	Being Closely Involved with Animals		T4	1	1.18	
	Characteristics of the Environment	Presence of Living Things	T7, T23	2	2.35	
		Presence of Various Animal Species	T9, T14, T22	3	3.53	
		Artificial Ecosystem	T29	1	1.18	
		Educational Environment	T28, T36	2	2.35	
		Environment Ready for Science	T2	1	1.18	
Total				85*	100	

*Frequency of teacher statements

Examination of teacher statements in Table 3 reveals that almost half of the teachers see zoos as an out-of-school learning environment that would assist the lessons of Science & Technology. Also; they have stated that it is an out-of-school learning environment in terms of assisting students' learning, influencing their cognitive and affective levels as well as the characteristics of the environment.

However, in contrary to these opinions, 4 teachers (T17,T21,T26,T30) expressed that there are setbacks to use zoos in a widespread manner as out-of-school learning environments, such as their not being suitable for second tap education programs, not being parallel to education programs and their being artificial environments.

Some direct quotes from teacher interviews;

"It can be done, it definitely can be done. It can be done; because they are directly involved with animals, as I said before, when they visit zoos they get an idea about animals, explore the lifestyle of animals, they will be aware of where they live, what they eat for example."(T4)

"...they will see different species, as in the variety of species maybe, but other than that.... I mean, our curriculum is not very parallel...not very parallel."(T26)

Table 4 gives the teacher opinions for the research question "Have you organized any visits to a zoo under the trip programs of your school? If you have, did you face any problems during such visits?", which had been asked to teachers during the interviews.

As a result of the interviews, it has been established that only 2 teachers have organized a visit, and 4 teachers are at planning stage. Other teachers said that they haven't organized or planned any visits.

Table 4. Opinions of Teachers, who Planned Zoo Visits, about Facing Problems

Data Source	Theme	Code	Teachers	Frequency (f)	Percentage (%)
Status of Facing Problems in Zoo Visits	No Problems	We did not have any problems	T8	1	16.67
		School Management Supported	T29	1	16.67
	Indefinite	At Planning Stage	T13, T19, T20, T23	4	66.67
Total				6*	100

*Frequency of teacher statements

In Table 4, examination of the statements of teachers, who organized visits, reveals that most teachers define the problems they faced during the visits they organized as indefinite. When we look at the statements; we see that a trip to a zoo is at planning stage and therefore, a clear opinion cannot be given about the problem status. 2 teachers, who have organized trips said that they did not have any problems.

Table 5 gives the teacher opinions for the research question “What are your reasons not to organize any trips to a zoo under the trip programs of your school?”, which had been asked to teachers during the interviews.

Table 5. Opinions of Teachers not to Organize any Trips to a Zoo

Data Source	Theme	Code	Teachers	Frequency (f)	Percentage (%)
Reasons for not Organizing any Trips to a Zoo	Teacher	Organization Problems	T3, T5, T24, T35	4	8.00
		Responsibility	T4, T36	2	4.00
		Efforts to Catch-up with Curriculum	T22	1	2.00
		Being a New Assignee	T25, T34	2	4.00
		Using Documentaries	T2	1	2.00
		Not Knowing about Out-of-School Learning Environments	T14	1	2.00
		Planned to be Later in the Program	T12	1	2.00
	Science and Technology Program	Being out of Lesson Purposes	T26	1	2.00
		Not Being Necessary for 2nd Level	T17	1	2.00
		Supply of Vehicle	T1, T9	2	4.00
	Transportation	Road Safety	T1, T36	2	4.00
		Environment's Distance	T3, T9, T15	3	6.00
		Entrance Fees	T4	1	2.00
	Financial	Economic Reasons	T15, T24, T28, T30	4	8.00
	Parents	Lack of Attendance	T1, T28	2	4.00
		Reluctance	T4, T6	2	4.00
	Official Correspondences	Permit Problems	T4, T9, T24, T28, T36	5	10.00
	Ministry	Examination System	T7	1	2.00
	Students	Lack of Attendance	T35	1	2.00
	Previously Done	In Club Studies	T16, T22	2	4.00
With Trip-Observation Branch		T11, T18, T27, T31, T32, T33	6	12.00	
At First Level		T5, T10, T21, T33, T36	5	10.00	
Total				50*	100

*Frequency of teacher statements

Examination of teacher statements in Table 5 reveals that teachers usually associate their not organizing a zoo trip to such trip's having been made previously. Other than that, we see that the prominent reasons are caused by teachers, students, program and parents as well as transportation, official correspondences, financial problems.

Some direct quotes from teacher interviews;

“We did not plan it in the second level but in the first level, they all go.”(T5)

“I planned and we went. There were no problems. I mean we had no problems.”(T8)

“I did not plan it. It is a bit of problematic situation and I was just recently assigned.”(T25)

Table 6 gives the teacher opinions for the research question “Do you think that a trip to a zoo affect the academic success of students? Why?”, which had been asked to teachers during the interviews.

Table 6. Opinions of Teachers on Zoos’ Effect on the Academic Success of Students When Used as an Out-of-School Learning Environment

Data Source	Theme	Code	Teachers	Frequency (f)	Percentage (%)	
Zoos’ Effect on the Academic Success of Students When Used as an Out-of-School Learning Environment	Learning	Permanent Learning	T5, T22, T31	3	5.26	
		Learning by Doing and Living	T2, T5	2	3.51	
		Learning by Using the 5 Senses	T1, T31	2	3.51	
		Effective Learning	T19, T34	2	3.51	
		Giving Meaning to Science	T3, T4	2	3.51	
	Supporting	Increasing Knowledge Level	T6, T9, T11, T12, T13, T18, T23, T24, T26, T28, T36	12	21.05	
		Understanding the Topics	T13	1	1.75	
		Solidifies Abstract Information	T1, T27	1	1.75	
		Future Scientific Studies	T19	1	1.75	
		Preference of Profession	T7, T15, T20, T35, T36	5	8.77	
		For Meeting Expectancies	T28	1	1.75	
		Prevents Forgetting	T9, T22	2	3.51	
		Affective Level	Love for the Lesson	T14, T16, T36	3	5.26
			Attitude towards the Lesson	T16	1	1.75
			Love for Animals	T8, T16, T24, T35, T36	5	8.77
			Interest for Animals	T8, T27	2	3.51
			Increases Interest for the Lesson	T16, T17, T35, T36	4	7.02
	Skills	Curiosity	T2, T11, T27	3	5.26	
		Making Inferences	T4	1	1.75	
		Having a Different Point of View	T32	1	1.75	
		Increasing Creativity	T5	1	1.75	
		Practice	T34	1	1.75	
	Total			57*	100	

*Frequency of teacher statements

Examination of teacher statements in Table 6 reveals that teachers generally relate the changes in academic success by using zoos among out-of-school learning environment, with learning. Also, the other majority of teacher statements express that the changes in academic success students are associated with students’ affective characteristics.

Some direct quotes from teacher interviews;

“Of course it has a great effect again. As I said before, under constructive education, it can make them fully learn by experiencing, seeing, by asking right at the moment as maybe ‘why’, ‘what is this for’.”(T2)

“It is very important how the evaluation is made; for academic success, the child will have an effective learning. And because he/she had an effective learning from there, it will definitely increase success ...” (T19)

Table 7 gives the teacher opinions for the research question “Do you think that a trip to a zoo affect the attitude of students towards science? Why?”, which had been asked to teachers during the interviews.

Table 7. Opinions of Teachers on Zoos’ Effect on the Concern of Students towards Science When Used as an Out-of-School Learning Environment

Data Source	Theme	Code	Teachers	Frequency (f)	Percentage (%)
Zoos’ Effect on the Concern of Students towards Science When Used as an Out-of-School Learning Environment	Learning	Makes Them Understand the Topic	T4, T12, T13, T16, T20, T24	6	10.00
		One-on-One Learning	T18	1	1.67
		Learning by Using the 5 Senses	T1, T5, T6, T22, T33, T35	6	10.00
	Supporting	Solidifies Abstract Information	T1, T15, T18, T24, T26, T35	6	10.00
		Provides Opportunity to Establish Relations with Daily Life	T2	1	1.67
		Knowledge Reinforcement	T16	1	1.67
		Understanding that Science is not Difficult	T1, T2, T3, T13, T22, T26, T36	7	11.67
		Increases Motivation	T8, T14	2	3.33
		Increases Interest for the Lesson	T9, T16, T17, T20, T28	6	10.00
		Developing Positive Attitude towards the Lesson	T20, T31	2	3.33
	Affective Level	Decrease in Fear Against Science	T7, T12, T17, T19, T26	5	8.33
		Love for the Lesson	T10, T11, T28, T31, T32, T33	6	10.00
		Love for Animals	T24	1	1.67
		Making the Lesson Fun	T23	1	1.67
		Tasting the Feeling of Success	T4, T16, T27, T28	4	6.67
		Student’s Being Comfortable	T12	1	1.67
Total	Curiosity	T5, T19, T23, T28	4	6.67	
				60*	100

*Frequency of teacher statements

Examination of teacher statements in Table 7 reveals that teachers generally relate zoos’ effect on the concern of students towards science, when used as an out-of-school learning environment, with students’ affective levels. Teacher statements show that using zoos will affect students’ affective characteristics and cause changes in concern/anxiety levels against science.

Some direct quotes from teacher interviews;

“Of course, it will absolutely affect when their anxiety is like that. When they have the thought of ‘I can do it’, the children will definitely do it...”(T16)

CONCLUSION, DISCUSSION AND SUGGESTIONS

Science and technology teachers stated their general opinions on zoos among out-of-school learning environments by making explanations about the characteristics of the environment (35.07%), its contribution to science and technology lesson (23.39%), purpose of going to these environments (22.07%), learnings at out-of-school learning environments (10.39%), and their influences on students (9.10%). In this context; teacher opinions focused first on the characteristics of the environment, and then the effects over learning. The reason for this may be that some teachers do not see zoos as out-of-school learning environments, perceive these environments as cruising and entertainment locations, and have a need to define this environment. As a matter of fact, in the study of Tofield, Coll, Vyle and Bolstad (2003); zoo visitors most commonly define their aims for visiting as having fun and a good time but most of them also state that zoos have a role in educational activities. Although teachers first focus on characteristics of the environment, at the same time, they stated that such environments can assist students' learning and the lesson by being associated with science and technology topics and units. Examination of teacher statements in this aspect reveals that most teachers relate zoos with Science and Technology Lesson.

Zoos' relation with science and technology lesson has been associated with their relation to Science and Technology lesson's topics and units (71.62%), their assistance to Science and Technology lesson (19.32%) and their relation with science (9.10%). Supporting the teachers' opinions, Ramey-Gassert's (1997) research states that; science learning environments provide a rich learning source to teachers, and make students achieve the aims of science education programs of schools. Andrew, Maggie and Sarah (2010) expressed that the events carried out by considering the lesson's acquisitions in such environments in a planned and programmed manner are effective educational activities. In this scope, regarding zoos' being out-of-school learning environments, it is seen that teachers mention its assistance to the lesson (47.07%), dimension of learning (21.19%), changes in students (20.01%) and the characteristics of the environment (11.77%). In this context, teachers said that under the purposes of Science and Technology lesson; zoos can help the progress of the lesson, and at the same time, influence students' cognitive and affective characteristics. When we look at teachers' opinions as zoos not being out-of-school learning environments; we see that they mention science and technology program (84.72%) and characteristics of the environment (14.29%). The reason for this may be that teachers might think that sixth graders cannot achieve the aimed learnings at zoos. Primary school first level educational program is seen more appropriate for events at zoos and zoos visits are made at these class levels. Despite this, it is seen that the very few teachers, who organized trips to zoos stated that these trips had no problems and some of the teachers are at the planning stage of such trips. Therefore; when teacher statements on zoo trip planning are examined; it is seen that the majority does not plan a trip to zoos. In this context, most teachers state the reason of their not organizing trips to zoos as such trips having been done before (26.00%). Other reasons for not organizing trips are listed as; teacher (22.00%), transportation (14.00%), official correspondences (10.00%), costs (10.00%), parents (8.00%), program (6.00%), the Ministry (2.00%) and students (2.00%). in parallel with the above teacher opinions, Kenny (2009) emphasized that; such environments have various benefits but the decision for utilizing them must be made by considering the facts such as transportation and high costs .

Almost all of the teachers expressed that students' academic success will change positively by using zoos as one of the out-of-school learning environments. The reasons for this effect are; learning in rich learning environments (47.08%), reinforcing existing learnings by supporting formal education activities with out-of-school learning environments (19.28%), and such environments' improving students' scientific processing skills (8.76%) and various affective characteristics (31.57%) (Randler, Baumgartner, Eisele and Kienzle, 2007).

Almost all of the teachers expressed that students' anxiety levels against the lesson will change positively by using zoos as one of the out-of-school learning environments. The reasons for this effect are defined as; its inclusion of learnings related to Science and Technology lesson (21.67%), its assistance to the execution of this lesson (28.34%) and its effect on students' affective characteristics (50.01%). In this scope; it has been stated that activities conducted at zoos show that Science and Technology lesson is not a difficult lesson as perceived by students, and that this lesson can be carried outside the classroom at a different learning environment in an entertaining and interesting way, and that these activities may cause to reduce the levels of anxiety towards science. In similar studies, it has been stated that "science topics delivered at zoos, being different from formal education environments, draw the interest and attention of students, and affect their attitudes towards the lesson and species" (Lukas and Ross, 2005; Randler, Baumgärtner, Eisele and Kienzle, 2007). The Literature covers studies stating that various affective characteristics are affected positively at out-of-school learning environments according to teachers' opinions (Ramey-Gassert, 1997; Braund and Reiss, 2006; Paris, Yambor and Packard, 1998; Falk and Adelman, 2003).

As stated in this study and in other studies in the literature; we see that teachers, students and parents generally perceive the purposes of zoo trips as entertainment and cruising. In order to change such perceptions; the visits to be made must be planned beforehand by being associated with the curriculum and performed as trips with

educational purposes under the lesson.

The position and importance among educational activities of using zoos as a support to formal education has been established in the study by being supported with teacher opinions. Although Science and Technology teachers are aware of using zoos by associating them with science and technology curriculum topics in science education; they expressed many reasons for not organizing zoo trips, being done before and problems caused by teacher qualities as being the major reasons. The teachers, who are the conductors of such activities, see zoos as an out-of-school learning environment if problems defined in matters related to animals are overcome. Although teachers see zoos as an out-of-school learning environments, we see that they do not plan zoo trips to support formal education. As a result; teachers expressed that they can utilize zoos as out-of-school learning environments under science and technology topics, which are included in educational activities, that zoos did/will positively affect students' various cognitive and affective characteristics, and that they can contribute to education. Results acquired by this study, in which Science and Technology teachers' opinions are assessed, make a contribution to the literature by showing the position and importance of zoos in Turkey. In addition to this study, similar interviews can be made with teachers about different out-of-school learning environments. Also, long-term extensive studies similar to this one can be made at different age groups, different class levels, different topics and lessons, questioning the effects of out-of-school learning environments over students.

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