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Research on the Environmental Knowledge and Environmental Awareness of Preschool Teachers [1]

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Abstract

The present study aimed to elicit the environmental knowledge and environmental awareness of preschool teachers. The research group of the study was comprised of 130 teachers serving at the independent nursery schools, training nursery school of the vocational school for girls, and nursery classes of primary schools in the province of Yozgat and its towns. Personal Information Form and Environmental Awareness Questionnaire were used as the data collection tools in the study. The Personal Information Form was developed by the researchers. The Environmental Knowledge and Environmental Awareness Questionnaire were used by Schrenk (1994) in Germany and by Erten (2002; 2003; 2005) in Turkey with partial amendments. Relational survey model was implemented in the research. In analyzing the data, Pearson Correlation calculations, parametric (t-test, ANOVA) and non-parametric tests (Kruskal Wallis, Mann-Whitney U Test) were used whether or not variables showed normal distribution. As a result of the research while a weak relation was observed between the Attitudes towards Environment and Environment-Friendly Behaviors (r=.40) and between Attitudes towards Environment and Environmental Knowledge (r=.47) of preschool teachers; a very weak relationship was found between Environment-Friendly Behaviors and Environmental Knowledge (r=.25). It was observed that the environmental awareness of preschool teachers was influenced by taking care of pets and flowers at home and by following daily news together with their friends. Consequently it was determined that the environmental knowledge and attitudes of preschool teachers had no effect of environmental-friendly behaviors.

Keywords: Preschool teacher, environmental knowledge, environmental awareness

1. Introduction

All living creatures need a milieu to subsist individually and collectively in interaction with other living and non-living elements that dwell in that milieu, i.e. the environment. All creatures are vitally dependent upon the environment; they are both influenced by, and have an effect on it. The environment is where the living creatures maintain all kinds of biological, social, cultural, and economic activities and meet the basic conditions of life, i.e. the requirements for nutrition, reproduction, and sheltering (Yıldız Sipahioğlu & Yılmaz, 2000). Environmental sensitivity, on the other hand, can be defined as the propensity to take positive initiatives towards environmental problems (Çalışkan, 2002, p.3). A sustainable ecologic balance is crucial for environmental interaction. According to Bakker (2006), only by behaviors the ecological balance can be maintained. Such behaviors would require a certain level of awareness, which depends upon the attitudes of individuals towards the environment.

One of the significant determinants of environmental consciousness is the behaviors of individuals towards the environment. Environmental literacy, individuals' emotions towards the environment, and personal participation of the individual have been suggested to be the factors that determine the environmentally-aware behaviors (Chan & Yam, 1995, Hungerford & Volk, 1990). The environmentally-aware behaviors are structurally complex; there is an interaction between the environmentally-aware behaviors and the environmental knowledge, environmental

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experience, and environmental awareness of the individuals (Kollmuss & Agyeman, 2002). Therefore environmental education is of critical importance in obtaining knowledge, developing environmentally-aware behaviors, and gaining environmental experiences. Environmental education is collaboration of the students, teachers, and society to bring solutions to environmental problems. Therefore environmental education is considered a discipline and it is related to attitudes, ethics, and actions. The environmental education is based on a way of thinking and life style (Davis, 1998).

The goals of environmental education include raising environmental awareness with regard to problems and possible solutions, showing respect to living creatures' right to life, raising awareness with regard to efficient use of environmental resources, and thus helping people with developing positive attitudes and values towards environment (Vrasidas, Zembylas, Evagorou, Avraamidou, & Aravi, 2007). For the purpose thereof, the teachers must recognize the factors that shape the environmental understanding of themselves and their students (Desjean-Perrota, Moseley & Cantu, 2008). Teachers, who are highly environmentally-conscious and environmentally-aware, who have sufficient ecologic knowledge, and who have the knowledge and experience to conduct theoretical and practical environmental practices are of great importance for the development of environmental education and for the attainment of its objectives (Kahyaoğlu, Daban, & Yangın, 2008). It is accepted worldwide that it is a vital necessity for humanity to preserve the environment and to educate people of all ages. Introduction of the said education as early as the preschool period will ensure development of positive environmental attitudes beginning from the early childhood. Therefore due to the fact that environmental awareness is a skill that develops especially during the preschool period, the preschool teachers assume great responsibilities. Furthermore preschool teachers must serve as a positive model to raise environmental awareness in children at early ages.

Many studies suggested that environmental education was important to ensure positive attitudes towards environment, and that it should be started as early as the preschool years (Domka, 2004; Palmer, 1995). Similarly Horwitz (1996) stated that interest in and association with the environment started at early ages. It was also suggested that the positive attitudes towards environment were shaped by formal education process, and that preschool education was very important in respect thereof (Taşkın, 2004, p.86), and even that environmental education was imperative at preschool period (Flogaitis, Daskolia & Agelidou, 2005). Therefore it is very important that the preschool teachers are provided with basic environmental knowledge and concepts and supported with regard to the importance of developing environmental consciousness at early ages (Kandır, Yurt & Cevher Kalburan, 2012). A study by Flogaitis & Agelidou (2003) found that the preschool teachers confuse the terminology regarding the nature and environment. Erten (2005) concluded in his study, which examined the environment-friendly behaviors of teacher candidates, that no teacher candidate involved in environmental activities in her or his spare times, that they were not uncomfortable with environmental problems and that they were not sufficiently aware with regard to environmental preservation.

On the other hand, certain studies suggested that environmental education improved the environmental attitudes of the teachers (Chatzifotiou, 2006; Meichtry & Smith, 2007; Volk & Cheak, 2003). Therefore providing the preschool teachers with in-service environmental education is important for development of positive environmental attitudes and ensuring retention. In the light of the foregoing, finding the level of environmental knowledge and environmental awareness of preschool teachers may play a significant role in guiding an in-service training program.

A literature review suggested that there were only a few studies aimed to ascertain the environmental knowledge and awareness of preschool teachers (Erten, 2005; Erten, Özdemir & Güler, 2003). As a matter of fact, finding the level of awareness of the preschool teachers is quite important in order to specify their needs for relevant training in their professional life. Therefore this study was planned on the grounds that a research on the environmental knowledge and awareness of the preschool teachers would contribute in the relevant literature.

2. Method

2.1. Research Model

The study was designed as a descriptive study with an aim to find the level of environmental knowledge and awareness of preschool teachers serving at independent kindergartens, nursery schools in primary schools, and practice nursery schools in vocational schools for girls in the city centera, towns, counties, and villages of Yozgat province. Survey model as one of the descriptive methods was adopted in this study. The survey research methodology allows describing the participants' views or characteristics such as interests, skills, talents, and attitudes. Survey researches are conducted in general with relatively larger samples. (Fraenkel & Wallen, 2006). Survey model aims to explain a present or past situation as it is or it was. Tarama modelinde araştırmaya konu olan birey ya da nesne, kendi koşulları içinde var olduğu gibi tanımlanmaya çalışılır In survey method, it is aimed to assess individuals or study objects in their own conditions (Karasar, 1995).

2.2. Study Group

The study group was comprised of 130 teachers, who accepted to participate in the study, out of 317 preschool teachers serving at nursery schools in primary schools, independent kindergartens, and practice nursery schools in vocational schools for girls in the Yozgat city and town centers, and at nursery schools in primary schools in *belde*s (large village with municipality) and villages of Yozgat and its towns.

2.3. Data Collection and Assessment

2.3.1 Data Collection Tool

"Personal Information Form" and "Environmental Knowledge and Environmental Awareness Questionnaire" were used as data collection tools in the study.

2.3.2. Personal Information Form: "The Personal Information Form" was developed by the researchers.

Environmental Awareness Questionnaire: The Environmental Knowledge and Environmental Awareness Questionnaire were used by Schrenk (1994) in Germany, and by Erten (2002, 2003, 2005, 2012, Erten; Erten, Özdemir & Güler, 2003) in Turkey with partial amendments. There were independent variables in the introduction section of the questionnaire, which consisted of personal questions regarding the participant, including the items with regard to the sex of participants, where they lived in their childhood years, what they used to do in their spare times, whether they used to speak to their friends and families about the environment, and whether they dealt with animals and plants in the past and present. Furthermore the questionnaire included 60 items regarding the students' environmental knowledge, attitudes towards environment, and behaviors towards environmental preservation, as composed of 20 items each on attitudes, behaviors, and environmental knowledge. These three domains were previously subjected to factor analysis and used as a scale in several studies in Turkey (Erten, 2002; 2003; Erten, Özdemir & Güler, 2003).

The propositions in the questionnaire were set from negative to affirmative and designed in five-scale: "I don't agree at all, I don't agree, I neither agree nor disagree, I agree, I absolutely agree" (Examples: "I feel sorry when I see used paper mixed up with other waste in the garbage bin," "The air that I breath harms my health," and "never, rarely, occasionally, often, very often" (Examples: "When we buy laundry detergent, my family and I check if it would harm the environment," "I prefer plastic binders, when I buy binders for use at school). The Cronbach α reliability of the questionnaire as applied in Turkey, with its subdomains, was .97. Cronbach α reliability values for

the attitude, behavior, and knowledge subdomains of the said questionnaire were .95, .90, and .92.5, respectively. The Cronbach α reliability of the questionnaire as a whole as applied in Azerbaijan was .84. Cronbach α reliability values for the attitude, behavior, and knowledge subdomains of the said questionnaire were .84, .77, and .77 (Erten, 2012).

2.4.1. Process and Application

The Personal Information Form and Environmental Knowledge and Environmental Awareness Questionnaire were handed over to the teachers, who participated in the seminars during the end-of-year seminar in the 2012-2013 educational year. A total of 317 questionnaires were distributed, and collected back one week later. 130 teachers, out of 317 preschool teachers filled in the questionnaires. Therefore the 130 teachers, who accepted to participate in the research, comprised the study group.

2.4.2. Analysis of Data

Correlation computations and depending on whether or not the variables demonstrated normal distribution parametric tests (t-test, ANOVA) or non-parametric (Kruskall Wallis, Mann-Whitney U Test) were performed in the analysis of data after assessed by SPSS program.

A parametric test, i.e. the *t*-test, was performed in order to ascertain, whether the age of the preschool teachers cause any difference in Attitude towards Environment, Environmental Knowledge, and Environment-Friendly Behaviors, on the grounds that the data demonstrated normal distribution.

A parametric test, i.e. the ANOVA test, was performed in order to ascertain whether the Attitude towards Environment Scores and Environment-Friendly Behaviors Scores of the preschool teachers varied by the service period in teaching profession, on the grounds that the data demonstrated normal distribution.

A non-parametric test, i.e. the Kruskal-Wallis test, was performed in order to ascertain whether the Environmental Knowledge Scores of the preschool teachers vary by the service period in in teaching profession, on the grounds that the data did not demonstrate normal distribution.

Due to the fact that the data demonstrated normal distribution Pearson correlation coefficient significance test was applied in order to find the total correlation between the Attitude towards Environment, Environmental Knowledge, and Environment-Friendly Behaviors.

3. Findings and Discussion

This study aimed to elicit the environmental knowledge and environmental awareness of the preschool teachers. The findings of the study are highlighted in below tables

Table 1. *t*-Test Results of Attitude towards Environment, Environmental Knowledge, Environment-Friendly Behaviors of Teachers by Age Group,

Age Group	N	X	S	sd	t	P

Attitude towards Environment	Age 30 and below	92	74.54	6.464	128	.323	.747
	Age 31 and above	38	74.11	8.272			
	Total	130					
	Age Group	N	X	S	sd	t	P
Environmental Knowledge	Age 30 and below	92	64.16	8.409	128	.569	.570
	Age 31 and above	38	63.24	8.503			
	Total	130					
	Age Group	N	X	S	sd	t	P
Environment-Friendly Behaviors	Age 30 and below	92	92	72.93	7.693	128	-1.417
	Age 31 and above	38	75.00	7.211			
	Total	130					

No statistically significant difference was found by teachers' age groups between the Attitude towards Environment Scores [$t_{(128)}$=.323, p>0.05], Environmental Knowledge Scores [$t_{(128)}$=.569, p>0.05], and Environment-Friendly Behaviors Scores [$t_{(128)}$=-1.417, p>0.05]. Environmental knowledge is expected to increase from early ages, as the person grows older. At each school level the knowledge would increase with education

A study by Erten, (2004) on the environmental education and environmental consciousness, which examined the environmental knowledge, attitude, and environmentally-friendly behaviors of students from Grade 5 to university, found that while 56% of the 5th grade students provided an affirmative reply regarding whether they knew the environment preservation signs, the same ratio was 79% with the university students.

Nevertheless, the study group of the present study was comprised of adults. Due to the fact that the study group was composed of the teachers, a statistically significant difference might not arise between the Attitude towards Environment, Environmental Knowledge, and Environment-Friendly Behaviors Scores by age. This is because of the fact that along with the age factor the environmental knowledge of the teachers depends also on being supported by the environmental awareness and service period in the profession, i.e. the professional experience. A study by Çabuk & Karacaoğlu (2003) on university students' views regarding environmental awareness also elicited similar results with the present study that there was no significant difference in environmental awareness by age.

Table 2. Descriptive Statistics and ANOVA Results on Attitude towards Environment Score by the Service Period in Teaching Profession

Service Period	**N**		**X**		**Ss.**	
Less than one year	30		73.07		8.238	
1 – 5 years	88		74.26		6.394	
6 years and above	12		78.92		6.842	
Total	130		74.42		7.010	
Source of variance	Total squares	Sd	Average of squares	F	p	Difference
Intergroup	299.797	2	149.899	3.152	**.046**	**3-1**
Intragroup	6039.772	127	47.557			
Total	6339.569	129				

p<.05

A statistically significant difference was found in Attitude towards Environment Scores by service period of teachers in teaching profession [$F_{(2-127)}$=3.152; p<0.05].
Tukey HSD test rendered that the Attitude towards Environment mean scores of teachers with a service period of 6 years and above, and those with less than one year were X=78.92, and X=73.07, respectively, the former being higher.

The environmental attitude and behaviors are influenced by various factors including ecological knowledge, environmental consciousness, level of education and culture, habitat, profession, income and financial status, sex, and age. The effect of the school and teacher in shaping the environmental attitudes and behaviors of the individuals cannot be denied. Teachers that are distant from environmental problems, who don't have sufficient ecological knowledge and culture, who do not possess deep background and knowledge, who are not equipped with vast experience and skills, and who fail to serve as a model for the children with their behaviors will experience difficulties in attaining the objectives of the environmental education (Atasoy, 2005).

Erten's (2003) study on environmentally friendly behaviors of preschool teachers, stated that in order for a desired environmental education can be provided in preschool institution, above all the teachers to serve in relevant institutions must have the environmental consciousness (Erten, 2003).

Table 3. Descriptive Statistics and ANOVA results on Environment-Friendly Behaviors Scores by Service Periods of Teachers in Teaching Profession

Service Period	**N**		**X**		**Ss.**	
Less than one year	30		72.07		7.114	
1 – 5 years	88		73.61		7.894	
6 years and above	12		76.67		5.662	
Total	130		73.54		7.586	
Source of variance	Total squares	Sd	Average of squares	F	p	Difference
Intergroup	182.911	2	91.455	1.604	.205	
Intragroup	7241.397	127	57.019			
Total	7424.308	129				

No statistically significant difference was found in Environment-Friendly Behaviors score by the service period in teaching profession [$F_{(2-127)}$= 1.604; p>0.05].

First, a tool is required to overcome the environmental problems, which is environmental education. The objective of environmental education is to educate individuals that demonstrate environmentally-friendly behaviors. These individuals are called the individuals with environmental consciousness (Erten, 2012). Therefore it can be said that service period in teaching profession would not lead to a difference, due to the fact that the teachers have already gained environmentally-friendly behaviors via education.

Table 4. Kruskal-Wallis Test Results for Environmental Knowledge Score by the Service Period in Teaching Profession

Service Period	**N**	**Mean Rank**	**Sd.**	**X^2**	**P**	**Difference**
Less than one year	30	62.40	2	6.998	**.030**	**3-2**
1 – 5 years	88	62.82				
6 years and above	12	92.88				

p<.05

A statistically significant difference was found in the Environmental Knowledge Scores by the service period of teachers in teaching profession [$X^2_{(2)}$= 6.998; p<0.05]. The Mann-Whitney U Test revealed that the difference was in the "6 years and above" / "1 – 5 years" groups [U= 258.000; Z=-2.868; p<.05].

The environmental education would inform and raise awareness in all the individuals of the society, provide positive and permanent behavioral changes, and ensure active participation of individuals in solution of the problems. The environmental education must be dynamic in quality for the individuals (Özey, 2009, 24).

In order for the teachers can improve their teaching skills, they need to continuously renew their knowledge. A good teacher is expected to transfer one's knowledge and experience to the students. Service period in teaching profession is important in the foregoing transfer process. In a study by Güler (2009), which aimed to find the changes in the views of participant teachers regarding nature and environmental education upon one-day ecology-based environment training, the teachers, who acquired new concepts, knowledge, and skills, especially stated the ways of conveying knowledge to students in detail and emphasized that the environmental education should have been provided in the nature in order to ensure that the students are environmentally-aware.

The age group of the students of the preschool teachers is not a factor that has an effect on the teacher's environmental consciousness, nevertheless, as the environmental awareness of the teacher rises and as the teacher equips oneself regarding environmental education, the teacher will have a great contribution in the environmental education of children regardless of their age group.

Attitude towards Environment, Environmental Knowledge, and Environment-Friendly Behaviors of the teachers by the number of children in classroom and the age groups of the students were also examined in the study, although the relevant tables were not included in the present paper. It was found that there was no significant difference in the Attitude towards Environment, Environmental Knowledge, and Environment-Friendly Behavior Scores of the teachers by the number of children in classroom and the age groups of the students (p>0.05).

Table 5. Total Correlation between the Attitude towards Environment, Environment-Friendly Behaviors and Environmental Knowledge of Preschool Teachers

			Environmental Consciousness		
			Attitude towards Environment	Environment-Friendly Behaviors	Environmental Knowledge
Environmental Consciousness	Attitude towards Environment	r	1	.406**	.472**
		p	,	.000	.000
		N	130	130	130
	Environment-Friendly Behaviors	r		1	.250**
		p		,	.004
		N		130	130
	Environmental Knowledge	r			1
		p			,
		N			130

A review of Table 5 suggests that the correlation coefficient between the Attitude towards Environment and Environment-Friendly Behaviors of the preschool teachers is r=.40, indicating a weak relationship. The correlation coefficient between the Attitude towards Environment and Environmental Knowledge of the preschool teachers is r=.47, again indicating a weak relationship. The correlation coefficient between the Environment-Friendly Behaviors and Environmental Knowledge is r=.25, indicating a very weak relationship.

The environmental consciousness notion brings together three components: environmental knowledge, environmental attitude, and environmental behaviors. Environmental knowledge covers one's information with regard to the tendencies and developments in the fields of nature and ecology. Environmental attitude covers all the negative and positive attitudes and thoughts of individuals regarding environmentally helpful behaviors such as fear, anger, uneasiness, and value judgments due to environmental problems and readiness for resolution of environmental problems. Environmental behavior is the environmentally-friendly behaviors in the daily life (Erten, 2000).

As also specified by Erten (2012), the existence of the relationship, albeit weak, indicates that the attitudes, knowledge, and behaviors of the preschool teachers are not interdependent and they do influence each other. A relationship between attitude and knowledge is expected. The level of this relationship is directly proportional with the level the knowledge and that attitudes influence each other. In a study by Erten (2012), which aimed to elicit the environmental consciousness of university youth and find out whether there was a difference between the Turkish and Azerbaijani university youth in terms of environmental consciousness, it was observed that the Pearson correlation values for the Turkish students were 0.253 between attitude and knowledge, 0.383 between attitude and behavior, and 0.340 between behavior and knowledge. It was concluded that these results proved the fact that the attitudes, knowledge, and behaviors of the students were not interdependent and that they influenced each other.

Similarly Günindi (2010) also found a weak correlation of .473 between preschool teachers' attitudes towards environment and attitudes towards preservation of the environment in a study aimed to find the relationship between the environmental knowledge, attitudes towards environment, and attitudes towards preservation of the environment by the teachers.

As mentioned in the method section above, certain independent variables were included in the questionnaire. There are independent variables in the introduction section of the questionnaire, which consist of personal questions regarding the participant, including the items with regard to the sex of participants, where they lived in their childhood years, what they do in their spare times, whether they speak to their friends and families about the environment, and whether they deal with animals and plants in the past and present.

A review of these independent variables, which might have an effect on the environmental consciousness of the preschool teachers, suggested that 9.2% of the preschool teachers were grown up in villages and towns, 69.2% in minor cities, and 21.5% in large cities, that nearly 70% of the preschool teachers cared for homegrown plants and 30% with pets, that almost all spoke to their colleagues and families about environmental issues, that they wanted in-service training on environmental education at preschool level, that 70.8% of the teacher read news about environmental problems, 61.5% conducted activities regarding environment, and that the foregoing activities mostly included environmental cleaning, environmental preservation, planting, garden making, site visits, recycling, and energy saving.

4. Conclusion and Recommendation

This study aimed to elicit the environmental knowledge and environmental awareness of the preschool teachers. The findings of the study suggested below consequences:

As a result of the study a weak relationship was found between the Attitude towards Environment and Environment-Friendly Behaviors (r=.40), a weak relationship between Attitude towards Environment and Environmental Knowledge (r=.47), and a very weak relationship between Environment-Friendly Behaviors and Environmental Knowledge (r=.25).

A statistically significant difference was found in Attitude towards Environment and Environmental Knowledge scores by the service periods of the teachers in teaching period. However, no significant difference was found in Environment-Friendly Behaviors scores by the service periods of the teachers in teaching period. No statistically significant differences were found in Attitude towards Environment, Environmental Knowledge, and Environment-Friendly Behaviors Scores of the teachers by the age groups.

No statistically significant differences were found in Attitude towards Environment, Environmental Knowledge, and Environment-Friendly Behaviors Scores, by the number of children in classroom and the age groups of the students. Below recommendations can be made in line with the findings of the study:

- Project activities regarding training in nature may be included in order to allow teachers having direct experience with the environment.
- In order to raise students' awareness regarding the environment at early ages, the teachers may repeat open-air activities such as learning by natural observation, questioning, and exploration more frequently.
- The preschool teachers should be given information on various notions regarding especially the environmental education, and provided with theoretical and practical training opportunities, which would help them gain experience in preparing environmental education programs.
- Teachers should be supported by seminars, conferences, and in-service trainings on organization and practice of environmental education programs with family participation.

- Such opportunities as nature camps that would contribute in the professional life of the teachers and the development of the students may be provided.

References

Bakker, M. J. H. (2006). Culture affects environmental attitudes: Analysis of attitudes towards the environment of management of hotels around the globe. Unpublished master's thesis, Erasmus University, The Netherland.

Chan, R.Y., & E. Yam. (1995). Green movement in a newly industrializing area: A survey on the attitudes and behaviour of the Hong Kong citizens. Journal of Community & Applied Social Psychology 5, 273–284.

Chatzifotiou, A. (2006). Environmental education, national curriculum and primary school teachers. Findings of a research study in England and possible implications upon education for sustainable development. The Curriculum Journal, 17(4), 367-381.

Çabuk, B. ve Karacaoğlu, C. (2003). Üniversite öğrencilerinin çevre duyarlılıklarının incelenmesi. Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi, 36(1-2), 189-198.

Çalışkan, M. (2002). Yetişkinlerde çevre duyarlılığını etkileyen etmenler. Yayınlanmamış yüksek lisans tezi, Ankara Üniversitesi Eğitim Bilimleri Enstitüsü. Ankara.

Davis, J. (1998). Young children, environmental education, and the future. Early Childhood Education Journal, 26(2), 117-123

Desjean-Perrota, B., Moseley, C., & Cantu, L. E. (2008). Preservice teachers' perceptions of the environment: Does ethnicity or dominant residential experience matter? Reports & Research, 39(2), 21-31.

Domka, L. (2004). Environmental education at pre-school. International Research in Geographical and Environmental Education, 13(3), 258-263.

Erten, S. (2000). Empirische Untersuchungen zu Bedingungen der Umwelterziehung - ein interkultureller Vergleich auf der Grundlage der Theorie des geplanten Verhaltens. Tectum Verlag. Marburg.

Erten, S. (2002). İlköğretimin II. kademsindeki (6.7.8. sınıflar) öğrencilerde çevreye yaralı davranışların araştırılması, V. Ulusal Fen Bilimleri ve Matematik Eğitimi Kongre kitabı. 16-18 Eylül, 2002. Orta Doğu Teknik Üniversitesi/Ankara

Erten, S. (2003). Okul öncesi öğretmen adaylarında çevreye yararlı davranışların araştırılması", OMEP 2003 Dünya Konsey Toplantısı ve Konferansı, Kuşadası/ Türkiye

Erten, S., Özdemir, P. ve Güler, T. (2003). Okul öncesi eğitim kurumlarındaki öğretmenlerin çevre bilinci düzeylerinin ve bu okullardaki çevre eğitiminin durumunun belirlenmesi, OMEP 2003 Dünya Konsey Toplantısı ve Konferansı, Kuşadası/ Türkiye.

Erten,S. (2004). Çevre eğitimi ve çevre bilinci nedir, çevre eğitimi nasıl olmalıdır?,Çevre ve İnsan Dergisi, Çevre ve Orman Bakanlığı Yayın Organı. Sayı 65/66.-internet çıktısı olduğu için sayfa noları yok Ankara. http://yunus.hacettepe.edu.tr/~serten/makaleler/cevre.pdf. Erişim Tarihi: 01.07.2014.

Erten, S. (2005). Okul öncesi öğretmen adaylarında çevre dostu davranışların araştırılması. Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 28, 91-110.

Erten, S. (2012). Türk ve Azeri öğretmen adaylarında çevre bilinci (Environmental consciousness among Turkish and Azeri candidate teachers). Eğitim ve Bilim/ Education and Science, 37(166), 88-100.

Güler, T. (2009). Ekoloji temelli bir çevre eğitiminin öğretmenlerin çevre eğitimine karşı görüşlerine etkileri. Eğitim ve Bilim, 34(151), 30-43.

Günidi, Y. (2010). Okul öncesi öğretmenlerinin çevre dostu davranışlarının araştırılması. Tübav Bilim Dergisi, 3(3), 292-297

Flogaitis, E., & Agelidou, E. (2003). Kindergarten teachers' conceptions about nature and the environment. Environmental Education Research, 9(4), 125-136.

Flogaitis, E., Daskolia, M., & Agelidou, E. (2005). Kindergarten teachers' conceptions of environmental education. Childhood Education Journal, 33(3), 125-136.

Fraenkel, J.R. & Wallen, N.E. (2006). How to design and evaluate research in education. (6th Ed.). New York: McGraw-Hill International Edition.

Horwitz, W. A. (1996). Developmental origins of environmental ethics: The life experiences of activists. Ethics and Behavior, 6(1), 29-54.

Hungerford, H.R. & Volk, T.L. (1990). Changing learner behavior through environmental education. Journal of Environmental Education, 21(3), 8-21.

Kahyaoğlu, M., Daban Ş. ve Yangın, S. (2008). İlköğretim öğretmen adaylarının çevreye yönelik tutumları. Ziya Gökalp Eğitim Fakültesi Dergisi, 11, 42-52.

Kandır, A., Yurt, Ö. ve Cevher - Kalburan, N. (2012). Okul öncesi öğretmenleri ile öğretmen adaylarının çevresel tutumları yönünden karşılaştırılması. Kuram ve Uygulamada Eğitim Bilimleri Educational Sciences: Theory & Practice - 12(1) Kış/Winter 317-327

Karasar, N. (1995). Bilimsel araştırma yöntemi (9. Ed.). Ankara: Nobel Yayın Dağıtım.

Kollmus, A., & Agyeman, J. (2002). Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior? Environmental Education Research, 8, 239-260.

Meichtry, Y., & Smith, J. (2007). The impact of a place-based professional development program on teachers' confidence, attitudes, and classroom practices. Reports & Research, 38(2), 15-31.

Özey, R. (2009): Çevre sorunları. Aktif Yayınevi, İstanbul.

Palmer, J. A. (1995). Environmental thinking in the early years: Understanding and misunderstanding of concepts related to waste management. Environmental Education Research. 1(1), 35-45.

Schrenk, M. (1994). Umwelterziehung an der Förderschule. IPN. Kiel.

Taşkın, Ö. (2004). Postmaterialism, new environmental paradigm and ecocentric approach: A qualitative and quantitative study of environmental attitudes of Turkish senior high school students. Yayımlanmamış doktora tezi, Indiana University, Bloomington, IN.

Volk, T. L., & Cheak, M. J. (2003). The effects of en environmental education program on students, parents, and community. The Journal of Environmental Education, 34(4), 12-25.

Vrasidas, C., Zembylas, M., Evagorou, M, Avraamidou, L., & Aravi, C. (2007). ICT as a tool for environmental education, peace, and reconciliation. Educational Media International, 44(2), 129–140.

Yıldız, K., Sipahioğlu, Ş. ve Yılmaz, M., (2000). Çevre bilimi, Ankara: Gündüz Eğitim ve Yayıncılık.