

An Investigation of The Relationship Between Ecological and Materialistic Values of Turkish Teacher Candidates

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Abstract

Materialistic values are important factors that guide individuals' philosophy of life. For this reason, it is thought that individuals' environmental attitudes and ecological world views may be related to their materialistic values. Therefore, the purpose of this study is to examine whether there is a relationship between the materialistic and ecological values of prospective teachers. The study sample consists of 685 prospective teachers studying in a Faculty of Education at a university in northern Turkey. In the 2016-2017 academic year, prospective teachers who participated in this study were studying in first and last grade level of five different departments: Social Studies (n=115); Science (n=149); primary education (n=151); Mathematics (n=134); and pre-school teaching (n=136). A questionnaire including the New Ecological Paradigm Scale (NEPS), and the Material Values Scale (MVS) was used to gather data. The mean scores of both scales were based on the interpretation of the research findings, and the relationship between materialistic and environmental values of sample and variables such as gender, grade level, the field of teaching, and environmental education were examined. The correlations among materialistic and environmental values and environmental education were also examined. The results of the study demonstrated that prospective teachers have high levels of eco-centric values and moderate levels of materialistic values; also, these values have significant relations with some of the variables. The findings indicated there were negative or positive weak correlations between some variables.

Keywords

New Environmental Paradigm Scale, Materialism, Prospective Teachers, Environmental Education

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From the 19th Century to the 20th Century, several developments such as industrialization, urbanization, tourism, transportation and population growth have changed people's lifestyles. Such developments are due to the influence of innovations in science and technology. Nowadays, due to the ongoing nature of development, many changes have occurred to the production and consumption habits of people. Through various channels, such as media in particular, people living in both developed and developing countries have been virtually encouraged to produce more and increase their consumption. Due to this rapid increase in supply and demand, the pressure of humans on the natural environment has gradually increased, and the natural environment has become increasingly degraded (Atasoy, 2006).

The fact that environmental problems have reached dimensions threatening the whole of humanity has revealed the necessity for discussing these problems across international platforms. In particular, the importance of environmental education at all levels of education has been highlighted by representatives from a great number of international and intergovernmental organizations and agencies such as the 1971 Environmental Education Conference of the International Union for the Conservation of Nature and Natural Resources (IUCN); the 1975 International Belgrade Workshop; the 1977 Tbilisi Conference; and 1992 United Nations Conference on Environment and Development, Earth Summit (Carter & Simmons, 2010; Palmer, 2002; Wheeler, 1985). The UNESCO-UNEP International Environmental Education Program has described the preparation of teachers as "the priority of priorities" for action to improve the effectiveness of environmental education (UNESCO-UNEP, 1990). Furthermore, the objectives of environmental education as defined by the Tbilisi Intergovernmental Conference on Environmental Education in 1977 have been declared as awareness, sensitivity, attitudes, skills, participation (Hungerford & Volk, 1990). Following such developments, certain topics including environmental knowledge, environmental awareness, environmental attitudes, environmental ethics, and environmental values have become popular areas of interest for researchers who work across both the sciences and social sciences (Rickinson, 2001; Wray-Lake, Flanagan, & Osgood, 2010).

The term sustainable development has been talked about frequently since the 1960s and became a popular concept in the 1987 Brundtland Report. The Brundtland Commission's brief definition of sustainable development is understood as the ability to make development sustainable, that is, to ensure the needs of the present generation are met without compromising the ability of future generations to meet their own needs" (United Nations, 1987). The connotations of both of root words in this definition, "sustainable" and "development", are generally viewed as quite positive by most people. The combination of such words imbues the understanding that sustainability is a worthwhile value and goal, and is a powerful feature in diverse and conflict social contexts (Robert, Parris, & Leiserowitz, 2005).

It was pointed out that universities, and especially teacher training institutions can be highly effective for environmental education (Bentham, Sinnes, & Gjøtterud, 2015). In the United Nations Decade of Education for Sustainable Development (2005 – 2014), it is emphasized that sustainable development issues should be integrated into education in a holistic and interdisciplinary manner (Achim, Stan, & Dragolea, 2018; Wals, 2014). One of the objectives of Education for Sustainable Development has focused on incorporating Sustainable Development into ordinary educational activities and reorienting curricula from pre-school to university (UNESCO, 2005). Furthermore, environmental education courses have been added to the curriculum of many universities or schools (Kilbourne & Carlson, 2008). It is thought that environmental education in school curricula and hence the teachers who undertake training in environmental education have an important role to play in developing attitudes and behaviors of students towards the environment (Stevenson, 2007). In recent years, according to the results of discussions between scholars and researchers about the "nature of environmental education", it is suggested that environmental education should focus on environmental education for sustainability (EEFS) to improve the quality of life for all citizens (Tilbury, 1993). Consequently, numerous theories and models have been developed about how environmental education should be planned, developed and implemented.

Over the last 30 years, many psychologists and sociologists have tried to explain the roots of the complex interactions occurring between humans and the environment. Numerous researchers have investigated a variety of variables which are hypothesized to be associated with responsible environmental behavior (Kollmuss & Agyeman, 2002). Consequently, many researchers who are many researches interested in this subject have developed a series of theories and models. For example, the theory of reasoned action (Fishbein & Ajzen, 1980); the model of responsible environmental behavior (Hines, Hungerford, & Tomera, 1987), the model of ecological behavior created by Fietkau and Kessel in 1981 (Shamuganathan & Karpudewan, 2015). In the model created by Blake (1999), it was defined as individuality, responsibility, and practicality that three barriers between environmental concern and action.

The oldest and simplest models of pro-environmental behavior were based on the fact that the increase in environmental knowledge leads to increased environmental awareness and interest. As a result, pro-environmental behaviors could occur in individuals (Hungerford & Volk, 1990; Kollmuss & Agyeman, 2002). In other words, it was assumed that education about the environment leads to pro-environmental behavior (Burgess, Harrison, & Filius, 1998). Although the findings of many previous studies about environmental education supported this idea that environmental awareness and interest showed a positive development since the 1970s, some studies draw attention to the mismatch between environmental attitudes and behaviors (Albayrak, Caber, Moutinho, & Herstein, 2011; Alwitt & Pitts, 1996; Kilbourne & Carlson, 2008). This means that individuals with pro-environmental attitudes may not always have pro-environmental behaviors

(Kollmuss & Agyeman, 2002; Wray-Lake et al., 2010). Many researchers have tried to explain such a gap between attitudes and behaviors; and Rajecki (1982) defined four causes: direct versus indirect experience; normative influences such as social norms, cultural traditions, and family customs influence and shape people's attitudes; temporal discrepancy, which refers to the fact that people's attitudes change over time; and attitude-behavior measurement.

Kollmuss and Agyeman (2002) reported that all of the models developed to explain the attitude–action gap and investigate the barriers towards pro-environmental behavior, have some validity in certain circumstances. Also, it was pointed out that there are commonalities, contradictions, and omissions that can be found in the different models (Kollmuss & Agyeman, 2002). Researchers distinguished have the specific factors established as having some influence (positive or negative) on the models of pro-environmental behavior. Such factors were listed as “demographic factors, external factors (for example, institutional, economic, social, and cultural factors) and internal factors (for example, motivation, environmental knowledge, awareness, values, attitudes, emotion, locus of control, responsibilities, and priorities)” (Kollmuss & Agyeman, 2002, p. 248).

Environmental values amongst the above factors were one of the research topics of environmental psychology that emerged primarily in the US in the 1960s (Bonnes & Secchiaroli, 1995), and this term refers to value judgments guiding how people interpret nature. This study focused on values and attitudes that have a very important role in determining pro-environmental behavior. Callicott (2004, p. 36) stated that “environmental values are located at two ends: intrinsic and instrumental. An instrumental value approach forms the basis of a mechanistic worldview and anthropocentric environmental values, and is based on the belief that nature exists for the benefit of humans.” According to an instrumental approach, all beings or other lifeforms in nature are valuable and important to the extent of their benefits to people. In contrast, the intrinsic value approach forms the basis of an ecological worldview and eco-centric environmental values, where all the living beings in nature are valuable and their values come from their existence (Justus, Colyvan, Regan, & Maguire, 2009). Values specific for this field are determiners of environmental attitudes and behaviors ranging from vehicle use to recycling (Barr, 2007).

There are also findings to say that individual values, such as materialism, can be effective in shaping environmental attitudes and behaviors. In the Oxford English Dictionary, materialism is defined as an emphasis on or preference for that which is material, at the expense of spiritual or other values (“Materialism”, n.d.). Richins and Dawson (1992) defined materialism as an individual value, which included an emphasis on material assets. Materialism includes features such as indulgence and status, jealousy, insensitivity to and around social issues, selfishness, lack of principle, insecurity, desire to own and discrimination (Richins & Fournier, 1991). Also, Belk (1985) defined materialism as the importance a consumer attaches to

property acquisition. For people with strong materialist tendencies, the acquisition of property is the main purpose of their lives, and this is seen as the source of satisfaction and dissatisfaction. According to the results of the same studies conducted on environmental issues within the marketing discipline, it was revealed that consumption patterns, materialistic tendencies or value judgments defining the dominant social paradigm of western industrial societies have a negative influence on environmentally friendly behaviors (Wals, 2014). For this reason, the influence of materialism on environmental degradation, environmental attitudes, and behaviors should be closely examined (Kilbourne & Pickett, 2008).

It is also stressed that “materialistic values are important to consider concerning environmental attitudes and behavior for two reasons: first, there is considerable theoretical and empirical support that this particular value may be negatively related to environmental outcomes, and second, it is an individual difference which may be more readily influenced than personality variables” (Hurst, Dittmar, Bond, and Kasser 2013, p. 257).

In this context, it would be appropriate to consider the materialist values of the individuals. Although a negative correlation has been put forward between individuals’ materialistic tendencies or values and their environmental attitudes and behaviors by some studies (Hirsh & Dolderman, 2007; Hurst et al., 2013; Kemmelmeier, Krol, & Kim, 2002), However, it is noteworthy there is a lack of literature on the correlation between environmental values and materialistic values of teachers and prospective teachers. This is important because teachers and prospective teachers have an important role to play in the development of future generations as eco-friendly citizens. Consequently, the present study was conducted on the correlation between the environmental values and materialistic values of prospective teachers in Turkey who are studying in different fields of teaching. Also, the current study focuses on the following questions:

1. Is there any difference between the mean scores of environmental values and materialistic values of prospective teachers in terms of the following variables: gender, year of study, the field of teaching, and environmental education?
2. What is the correlation between the environmental values and materialist values of prospective teachers?

Methodology

Research Design

This study was conducted as a survey study in which “an attempt to obtain data from members of a population to determine the current status of that population concerning one or more variables” (Fraenkel, Wallen, & Hyun, 1993, p. 17). This type of research can be conducted with a specific target group or across multiple groups along with comparative analysis. A correlation study was conducted. The correlation research used one of the primary quantitative research methods to correlate two or more variables using mathematical analysis methods (Kaptan, 1998; Karasar, 2002; Sönmez & Alacapınar, 2016). Accordingly, the current study

focused on whether or not there were significant differences in the scale dimensions of some demographic variables, and the correlation that may or may not exist between the environmental values and materialistic values of prospective teachers who participated in the study.

Study Group

The study sample was determined by a random sampling method. The study sample consisted of prospective teachers who volunteered to answer the paper survey used as a data collection tool. A total of 685 respondents were studying in different departments of the Faculty of Education. Demographic data of the sample are summarized in Table 1.

Table 1
The Demographic Characteristics of The Study Group

Demography	Groups	F	%
Gender	Male	182	27
	Female	503	73
Grade level	1	336	49
	4	349	51
Departments	Social studies teachings (SST)	115	17
	Science teaching (ST)	149	21
	Primary school teaching (PST)	151	22
	Mathematic teaching (MT)	134	20
	Preschool teaching (PT)	136	20
	Total	685	100

Data Collection Tool

A paper survey consisting of three parts was used as a data collection tool. The first part of this survey contained personal information such as gender, year of study, the field of teaching (or department). In this section there was also a question about whether or not the participants had previously taken any environmental education course.

In the second part of the survey, there was the New Ecological Paradigm Scale (NEPS) which enabled us to make a distinction between an individuals' eco-centric and anthropocentric environmental views. The NEPS was first developed by Dunlap and Van Liere in 1978 (Dunlap & Van Liere, 1978). Later in 2000 it was revised to improve the psychometric properties of the scale (Dunlap, Liere, Mertig, and Jones, 2000). Items in the NEPS emphasized the progress of impact on the new ecological world, the prevailing social paradigm, the use of technology, and the environment for growth. The revised scale was then called the New Ecological Paradigm Scale and it was translated into Turkish by some researchers, with validity and reliability studies being conducted with different samples at different times (Aytaç & Öngen, 2012; Erdoğan, 2009; Erkal, Kılıç, & Sahin, 2012). Of these 15 items, 8 items are related to ecological eco-centric views, whereas 7 items are related to anthropocentric views. Due to the 5 point-Likert-type scale, scores in the eco-centric dimension of NEPS range from a minimum of 8 to a maximum of 40, whereas scores in the anthropocentric dimension of NEPS range from a minimum of 7 to a maximum of 35. If a participant has very strong eco-centric values, the participant will be able

to take a maximum of 48 points, whereas if a participant has very strong anthropocentric values, the participant will be able to take a maximum of 42 points. The alpha co-efficient of NEPS was reported as .83 (Dunlap et al., 2000). For the current study, the Cronbach alpha co-efficient for eco-centric and anthropocentric dimensions of NEPS and the whole scale were found as .69, .70, and .72 respectively.

In the third part of the survey, there was the Materialist Value Scale (MVS) developed by Richins and Dawson (Richins & Dawson, 1992). This scale includes a total of 18 items including the dimensions of centrality (items 1 to 6), success (items 7 to 13) and happiness (items 14 to 18). Researchers reported that “the seven centrality items produced alpha co-efficient between .71 and .75; the six-item success subscale alpha ranged from .74 to .78; and for the five happiness items, alpha was between .73 and .83. When combined into a single scale, alpha for the 18 items varied between .80 to .88” (Richins & Dawson, 1992, p. 310). The validity and reliability study of the Turkish version of MVS was conducted by Turan (2007). The researcher reported that the alpha co-efficient of the centrality, success, and happiness dimensions were .77, .74, and .72 respectively. The alpha for the 18 items was reported as .84. For the study at hand, alpha co-efficient were calculated as .82 for 18 items, and for these items’ alpha ranged between .79 and .82. Also, the alpha co-efficient for success, centrality, and happiness sub-scales were calculated as .56, .74, and .64 respectively.

Data Evaluation

The 5 point-Likert scale formats were used for both scales with response categories of strongly disagree (SD=1), mildly disagree (MD=2), unsure (U=3), mildly agree (MA=4), and strongly agree (SA=5). However, 8 of the items in MVS (items 3,6,7,8,9,13,14,15) were reverse coded. The mean scores were taken into consideration in the interpretation of data. Therefore, if the mean scores are close to 1 it is understood that pre-service teachers' ecological values or materialist values are weak, whereas if the mean scores are close to 5, their ecological values or materialist value judgments are assumed to be strong. The Kolmogorov-Smirnov (K-S) test was calculated to determine whether the data do not follow a normal distribution. As shown in Table 2, the test results indicated the data do not follow a normal distribution.

Table 2

The Kolmogorov-Smirnov (K-S) Test Results for the Overall Scales, and Sub-Dimensions

	Statistic	df	Sig.
Eco-centric (EC)	.116	685	.000
Anthropocentric (AC)	.088	685	.000
Success (S)	.081	685	.000
Centrality (C)	.076	685	.000
Happiness (H)	.069	685	.000
NEPS Total	.116	685	.000
MVS Total	.065	685	.000

It was decided to use non-parametric tests based on the test result. The Mann-Whitney U test was employed to determine whether the points of scales varied according to two independent variables such as gender, level of grade, and environmental education. The Kruskal Wallis H was used to determine whether the points varied according to the department of teaching. The correlation between the scale dimensions was determined by the Spearman Rho Correlation Coefficient (rho). Statistical calculations were based on a significance level of 0.05. The mean scores of both scales were interpreted based on Tekin's formula (range extend/ number of groups) (Tekin, 1996) as follows: 1,00-1,80= strongly disagree (SD); 1,81-2,60= mildly disagree (MD); 2,61-3,40=unsure (U); 3,41-4,20= mildly agree (MA); 4,21-5,00= strongly agree (SA).

Findings

The Results of NEPS And MVS Scores in Terms of Demographic Variables

Table 3 displays descriptive statistic results of the scores of NEPS total, eco-centric (EC) and anthropocentric (AC) sub-scales of NEPS, and MVS total, success (S), centrality (C), and happiness (H) subscales of MVS. The mean score of EC was calculated at 3.90, and this means that prospective teachers mildly agreed with eco-centric value judgments such as “we are approaching the limit of the number of people the earth can support”. In turn, the mean scores of AC were 3.13, and it means that prospective teachers were unsure about anthropocentric value judgments such as “humans have the right to modify the natural environment to suit their needs”. For all items of NEPS, the mean score was found 3.55 which corresponds to mildly agree on options. On the other hand, the mean scores MVS total, and MVS' subscales were ranged from 2.60 (centrality) to 2.80 (happiness). These results revealed that the materialist values of the prospective teachers were not very strong, and it was to draw attention that they were unsure about materialistic thoughts.

Table 3
The Descriptive Statistics of NEP and MVS Dimensions

Dimensions	N	Minimum	Maximum	Mean	Std. Deviation
Eco-centric (EC)	685	1.13	5.00	3.90	.56
Anthropocentric (AC)	685	1.43	5.00	3.13	.55
NEPS Total	685	1.60	4.87	3.55	.39
Success (S)	685	1.00	5.00	2.60	.66
Centrality (C)	685	1.14	5.00	2.59	.71
Happiness (H)	685	1.00	1.89	2.80	.72
MVS Total	685	1.00	4.39	2.65	.39

The Relation of NEPS And MVS Scores with Demographic Variables

In terms of the variables of gender, level of grade, and environmental education, The Mann-Whitney U test was conducted to analyze whether there were statistically significant differences between some independent samples. As shown in Table 4, there was no significant difference by gender for NEPS total and subscale scores. However, there was a significant difference between males and females in success

and happiness subscales of MVS. For the success subscale that included statements such as “tending to judge their own and others' success by the number and quality of possessions accumulated”, the test result indicated that the materialist values of men (Mdn= 2.67) were stronger than of women (Mdn= 2.50). $U = 40954.5$, $p = .03$. Similarly, for the happiness subscale that includes such “viewing possessions and their acquisition as essential to their satisfaction and happiness”, the test result indicated that the materialist values of men (Mdn= 3.00) were stronger than of women (Mdn= 2.80), $U = 39221.5$, $p = .00$.

Table 4

The Mann-Whitney U Test Results of Both Scale Dimensions by Gender

Dimensions	Gender	n	Mdn	Mean Rank	Sum of Ranks	U	z	p
Eco-centric	Male	182	4.00	352.23	64105.50	44093.5	-.74	.46
	Female	503	3.88	339.66	170849.50			
Anthropocentric	Male	182	3.14	363.70	66194.00	42005.0	-1.65	.09
	Female	503	3.14	335.51	168761.00			
NEPS Total	Male	182	3.60	358.93	65325.00	42874.0	-1.27	.20
	Female	503	3.53	337.24	169630.00			
Success (S)	Male	182	2.67	369.48	66146.00	42053.5	-2.11	.03*
	Female	503	2.50	333.42	168809.50			
Centrality (C)	Male	182	2.43	320.43	62068.50	45415.5	-1.80	.07
	Female	503	2.59	351.17	172886.50			
Happiness (H)	Male	182	3.00	379.00	68712.00	39487.0	-2.88	.00*
	Female	503	2.80	329.98	166243.00			
MVS Total	Male	182	2.66	356.22	67523.00	40676.0	-1.05	.29
	Female	503	2.61	338.22	167432.00			

The pre-service teachers who participated in this study were studying in the first (n=336) and last (n=349) grade level across different teaching departments at a Faculty of Education. The Mann Whitney U test results summarized in Table 5 revealed the mean scores of the first-grade levels were calculated as being higher than those of last-grade levels in all dimensions of two scales, except eco-centric and happiness subscales. In other words, anthropocentric values and materialistic values of those at the first-grade level are stronger than those in the last grade level. However, the differences between scores in the dimensions of anthropocentric, success, and centrality were statistically significant. Remarkably, materialistic values in the success subscale and centrality subscale included statements such as “placing possessions and their acquisition at the center of their lives” were stronger in the first year of undergraduate education. Likewise, there was a significant difference between the first (Mdn= 2.67 for MVS, and Mdn= 3.60 for NEPS) and last grades (Mdn= 2.61 for MVS, and Mdn=3.53 for NEPS) for MVS ($U = 51336$, $p = .00$), and NEPS ($U = 53331.5$, $p = .04$) scores.

An Environmental Education Course (EEC) is one of the general culture courses in the departments of Social Sciences Teaching (SST), Primary School Teaching (PST), and Science Teaching (ST) of some of the Faculties of Education at universities in Turkey. So, the participants were asked whether they took any EEC.

Table 5
The Mann-Whitney U Test Results of Both Scale Dimensions by Level of Grade

Dimensions	Grade		Mdn	Mean Rank	Sum of Ranks	U	z	p
	level.	N						
Eco-centric	1	336	3.88	333.73	112133.5	55517.5	-1.23	.23
	4	349	4.00	351.92	122821.5			
Anthropocentric	1	336	3.14	369.74	124233.5	49646.5	-3.48	.00*
	4	349	3.00	317.25	110721.5			
NEPS Total	1	336	3.60	358.78	120548.5	53331.5	-2.05	.04*
	4	349	3.53	327.81	114406.5			
Success (S)	1	336	2.67	362.99	121964.0	51916	-2.60	.00*
	4	349	2.50	323.76	112991.0			
Centrality (C)	1	336	2.71	373.65	125548.0	48332	-3.98	.00*
	4	349	2.43	313.49	109407.0			
Happiness (H)	1	336	2.80	343.26	115336.5	58543.5	-.03	.97
	4	349	2.80	342.75	119618.5			
MVS Total	1	336	2.67	364.71	122544.0	51336	-2.82	.00*
	4	349	2.61	322.09	112411.0			

Table 6 displays that a total of 330 respondents answered this question as “yes”, whereas 355 of them answered as “no” to it. The mean scores of the eco-centric subscale of those who participated in EEC (Mdn=4.00) were higher than those who did not (Mdn=3.88). However, the analysis results indicated that there was no significant difference between “yes” and “no” answers, $U= 54415.5$, $p= .11$. In contrast, there was a significant difference between “yes” (Mdn=3.00) and “no” (Mdn= 3.14) answers in the anthropocentric sub-scale, ($U= 49905$, $p= .00$). Similar to these results, there were significant differences for MVS total ($U= 50856.5$, $p= .00$), success ($U= 51002.5$, $p= .00$), and centrality ($U= 50246.5$, $p= .00$) subscales. These results suggested that the materialist tendencies of those who did not participate in this course were stronger.

Table 6
The Mann-Whitney U Test Results of Both Scale Dimensions by Environmental Education Course (EEC)

Dimensions	Response	N	Mdn	Mean Rank	Sum of Ranks	U	Z	p
	No	355	3.88	331.28	117605.5			
Anthropocentric	Yes	330	3.00	316.73	104520.0	49905.0	-3.362	.00*
	No	355	3.14	367.42	130435.0			
NEPS Total	Yes	330	3.53	329.43	108712.5	54097.5	-1.734	.08
	No	355	3.60	355.61	126242.5			
Success (S)	Yes	330	2.50	320.05	105617.5	51002.5	-2.936	.00*
	No	355	2.67	364.33	129337.5			
Centrality (C)	Yes	330	2.43	317.76	104861.5	50246.5	-3.225	.00*
	No	355	2.57	366.46	130093.5			
Happiness (H)	Yes	330	2.80	332.92	109864.0	55249.0	-1.290	.19
	No	355	2.80	352.37	125091.0			
MVS Total	Yes	330	2.56	319.61	105471.5	50856.5	-2.984	.00*
	No	355	2.61	364.74	129483.5			

Table 7a displays the Kruskal Wallis H (KWH) results according to departments. This analysis result revealed that there was a significant difference among 5

departments only in the eco-centric subscale of NEPS, $X^2_{(sd=4, n=685)} = 9.55, p = .04$. The mean rank of eco-centric scores was ranked between 364.44 (SST n=115) and 304.36 (MT n=136). Group scores were compared with the Mann Whitney U test to determine which groups differed. These test results indicated that these differences were between SST and MT groups, between ST and MT. This result recalls that the eco-centric values of prospective Social Studies and Science teachers have stronger than prospective teachers in other departments.

Table 7a

The Kruskal Wallis H Results of NEP Dimensions for Department Variable

Dimensions	Groups		\bar{x}	Mean Rank	X^2	Sd	p	Significant differences
	*	N						
Eco-centric	SST	115	3,93	364,44	9,55		,04*	SST-MT ST-MT
	ST	149	3,93	361,40				
	PST	151	3,87	328,26				
	MT	134	3,83	304,36				
	PT	136	3,97	359,15				
Anthropocentric	SST	115	3,09	324,10	7,28	4	,12	
	ST	149	3,17	349,27				
	PST	151	3,12	340,12				
	MT	134	3,21	378,26				
	PT	136	3,07	320,57				
NEPS Total	SST	115	3,54	342,27	1,41		,84	
	ST	149	3,58	356,75				
	PST	151	3,52	332,35				
	MT	134	3,54	347,58				
	PT	136	3,54	335,86				

*Social Studies Teachings (SST), science teaching, (ST), primary school teaching (PST), mathematic teaching (MT), preschool teaching (PT).

The KWH result indicated that there were significant differences among departments for MVS total and sub-scales of MVS. The mean rank of success sub-scale was between maximum 424.00 (SST) and minimum 309.25 (ST), and the U test result for this sub-scale showed that significant differences were between SST and other groups, and ST and MT, $X^2_{(sd=4, n=685)} = 28.92, p = .00$. In other words, materialist tendencies on the success of SST were stronger than other groups, while ST was weaker than other groups. In the centrality sub-scale, similarly, the highest mean rank was calculated in the SST group (Mean Rank= 437.9), whereas the lowest mean rank was calculated in the ST group (Mean Rank= 282.36). This difference between the mean scores of both SST and ST groups and the mean scores of other groups were found to be statistically significant, $X^2_{(sd=4, n=685)} = 42.65, p = .00$. The analysis results for happiness subscale ($X^2_{(sd=4, n=685)} = 37.62, p = .00$) and MVS total scores ($X^2_{(sd=4, n=685)} = 52.90, p = .00$) were similar to success and centrality scores (Table 7b).

Table 7b

The Kruskal Wallis H Results of MVS Dimensions for Department Variable

Success (S)	SST	115	2,89	424,00	28,92	,00*	SST- all groups ST-MT
	ST	149	2,47	309,25			
	PST	151	2,58	331,59			
	MT	134	2,61	357,76			
	PT	136	2,49	309,61			
Centrality (C)	SST	115	2,98	437,90	42,65	,00*	SST- all groups ST-PST ST-MT ST-PT
	ST	149	2,37	282,36			
	PST	151	2,56	332,86			
	MT	134	2,51	326,26			
	PT	136	2,61	356,94			
Happiness (H)	SST	115	3,06	413,93	37,62	,00*	SST- all groups ST-PST ST-MT ST-PT
	ST	149	2,55	270,58			
	PST	151	2,87	364,14			
	MT	134	2,82	352,01			
	PT	136	2,77	330,02			
MVS Total	SST	115	2,97	448,33	52,90	,00*	SST- all groups ST-PST ST-MT ST-PT
	ST	149	2,46	271,56			
	PST	151	2,64	343,97			
	MT	134	2,63	346,28			
	PT	136	2,61	327,89			

*Social Studies Teachings (SST), science teaching, (ST), primary school teaching (PST), mathematics teaching (MT), preschool teaching (PT).

The Correlations Relation to NEPS And MVS Scores, And EE Variable

The Spearman correlation analyses were computed among scales and EE variables for 380 participants. As shown in Table 8, the results suggest that 19 out of 27 correlations were statistically significant. The Spearman's rho revealed statistically significant negative correlations between EC and AC sub-scales of NEPS ($r_{s[380]} = -.590, p < .01$). Similarly, there were a significant negative correlation between EC with MVS' subscales S ($r_{s[380]} = -.114, p < .01$) and C ($r_{s[380]} = -.161, p < .01$); between MVS total and EC ($r_{s[380]} = -.152, p < .01$). However, the analysis results indicated nonsignificant correlation between EC sub-scale and EE ($r_{s[380]} = .062, p > .05$). In return, these significant correlations were positive for AC sub-scale of NEPS, while there was a negative significant negative correlation between AC and EE, ($r_{s[380]} = -.129, p < .01$). Although there was a negative correlation between NEPS and MVS, and a positive correlation between NEPS and EE, these correlations were not statistically significant. And, conversely, there was a significant negative correlation between MVS and EE ($r_{s[380]} = -.114, p < .01$).

Table 8
The Spearman Correlation Coefficients Between Variables

	EC	AC	S	C	H	NEPS	MVS	EE
EC	1.000	-.590**	-.114**	-.161**	-.056	.703**	-.152**	.062
AC		1.000	.145**	.097*	.076*	.666**	.124**	-.129**
S			1.000	.506**	.439**	.008	.799**	-.112**
C				1.000	.357**	-.071	.817**	-.123**
H					1.000	.014	.711**	.049
NEPS						1.000	-.039	.066
MVS							1.000	-.114**

** $p < 0.01$; * $p < 0.05$

Discussion

The research findings revealed that the eco-centric values of the prospective teachers were stronger than the anthropocentric values. On the other hand, the results of the analysis of MVS showed that the participants were unsure about materialism. The results of the analysis of the sub-dimensions of both scales proved that there were significant relationships for some of the independent variables. According to the analysis results of NEPS, the ecological attitudes of the participants did not differ statistically significant in the context of gender. This result is consistent with the results of some studies used NEPS to measure the environmental attitudes of Turkish undergraduates (Alagöz & Akman, 2016; Sever & Yalçinkaya, 2012; Tekin, 2012; Yalçinkaya, Karataş, & Talas, 2014). However, in a review of Zelezny, Chua, and Aldrich (2000b) focused on gender differences in environmentalism, it was reported that in the majority of studies which used NEPS, the environmental concerns of women were greater than men. However, only a few studies found there to be no significant difference between males and females about environmental concern; and no study found that males had significantly greater environmental concern than women. In the literature since the 1990s, similar results were found. There were some studies suggesting that women hold stronger pro-environmental values, beliefs, and attitudes, and participate more actively in the private sphere of environmental behaviors than men (Blocker & Eckberg, 1997; Casey & Scott, 2006; Davidson & Freudenburg, 1996; Erkal et al., 2012; Müderrisoglu & Altanlar, 2011; Taşkın, 2009; Xiao, Dunlap, & Hong, 2019). On the other hand, some theories have been developed to explain the relationship between gender and environmental attitudes or behaviors, albeit in a limited number. Of these theories, the most commonly used theory is related to processes of socialization and resultant gender roles. According to this theory, gender differences in environmental attitudes and behaviors may be the product of socialization rather than biological differences (Davidson & Freudenburg, 1996; Stern, Dietz, & Kalof, 1993). In almost all cultures, females are socialized as more interdependent, compassionate, nurturing, cooperative, and in caregiving roles, whereas males are socialized as more independent and competitive (Dietz, Kalof, & Stern, 2002; Smith, 2001; Vicente-Molina, Fernández-Sainz, & Izagirre-Olaizola, 2018; Zelezny, Chua, & Aldrich, 2000a). However, meta-analytic research that compares past and present

studies on gender and environmental attitudes and behaviors is needed to clarify the emergence of change over time so environmental attitudes may have changed from past to present (Zelezny et al., 2000b). Moreover, investigating the relationship between environmental attitudes and gender in 14 countries, Davidson and Freudenburg (1996) reported that gender differences in attitudes towards the environment are not universal. According to the findings of some research in China, used in support of this thesis, there were no significant difference in pro-environmental attitudes between Chinese men and women, whereas educated Chinese men may have stronger pro-environmental attitudes than women (Shields & Zeng, 2012; Xiao et al., 2019; Xiao & Hong, 2010, 2018). Logically, such findings suggest that the socialization theory to explain the relationship between environmentalism and gender may not be applicable in China or all of the other cultures.

The low MVS scores may be related to the fact that the participants were students and most of them did not have a regular income. However, the findings related to MVS demonstrated that there were differences in happiness and success subscales in terms of gender. In other words, the tendency to accept property acquisition as a source of happiness and success was stronger in men than in women. This result was consistent with the findings of some previous studies (Felix et al., 2013; Kamineni, 2005; Karabati & Cemalcilar, 2010; Segal & Podoshen, 2013; Workman & Lee, 2011). On the subject, Browne and Kaldenberg (1997) reported that males may be more likely to feel that owning material goods increases their happiness. In recent years, there has been a significant amount of literature that examines the relationship between gender and materialism. The results of such studies revealed that the relationship between gender and materialism was a controversial issue. In some of these studies, there was no significant relationship between gender and materialism (Burroughs & Rindfleisch, 2002; Dittmar, 2005; Handa & Khare, 2013; Richins & Dawson, 1992; Saunders, 2007), whereas, in other studies, females scored higher on materialism than males, in contrast to many studies that reported that men were more materialistic than women (Burroughs & Rindfleisch, 2002; O'Cass, 2001, 2004; Workman & Lee, 2011).

The research findings suggest that there may be a relationship between environmental education and environmental attitudes or materialist values. Significant differences between the first and last grades in the context of anthropocentric, centrality, and success scores may be related to environmental literacy. There was some evidence suggesting this in the research findings. Firstly, the environmental education course was one of the courses in third or fourth-grade levels in some departments of the Faculty of Education where participants were studying. The results of the analysis for anthropocentric, centrality and success scores revealed there were significant differences between those who took environment course and those who did not. Moreover, the results from the correlation analysis proved there was a negative correlation with the environmental education variable of anthropocentric, centrality, and success scores. Secondly, the

lowest eco-centric and the highest anthropocentric scores were those of the prospective mathematics teachers. This result may be related to the absence of any course on environmental education among the available courses in the curriculum of the Mathematics teaching department. Also, most of the prospective Mathematics teachers who participated in the study reported that they had not previously attended any courses on environmental education. Thirdly, the results of MVS revealed that the highest scores were noteworthy for prospective Social Sciences teachers when compared with their peers in other departments. This result can partly be explained with environmental literacy because, in this department, the MVS scores of those participated in environmental education course were lower than of those who did not. On the other hand, when the groups were compared based on the department variable, significant differences between MVS scores and environmental education variables were determined only for the social studies teacher group. In line with this, some of the previous studies reported that there was a negative correlation between environmental beliefs and materialist tendencies (Andersson & Nässén, 2016; Callicott, 2004; Hurst et al., 2013; Kilbourne & Pickett, 2008), whereas some of them have reported a positive relationship between environmental literacy and environmental attitudes (Koç & Karatekin, 2013; Pe'er, Goldman, & Yavetz, 2007; Yalçinkaya & Çetin, 2018).

Conclusion

As put forward by previous studies examining the relationship between the level of income and materialism (Dávila, Casabayó, & Singh, 2017; Goldberg, Gorn, Peracchio, & Bamossy, 2003; La Barbera & Gürhan, 1997; Larsen, Sirgy, & D. Wright, 1999), and between the level of income and environmental attitudes (Arcury, 1990; Martinsson, Lundqvist, & Sundström, 2011; Özden, 2008; Scott & Willits, 1994), people in low-income households can be more materialistic and weaker environmental attitudes than those in higher-income families. Therefore, the results of the present study can partly be related to the level of family income. However, it was not possible to make a comparison among lower-middle and upper-income groups because the students participating in the study reported their families' monthly income as \$600 or less. Therefore, the relationship between materialism and environmentalism with examples from different income groups may be the subject of research for further studies. The results of the study shown that a weak negative correlation among eco-centric values, environmental education, and materialistic values. These results suggest that if the environmental values of the individuals are high, their materialistic values may be low; also, environmental literacy may be an important determinant in this regard. Undoubtedly, it is not possible to generalize with the findings of this research, therefore, different research findings are needed to support this subject. However, if environmental literacy is "the priority of priorities" for a sustainable environment (Fien & Tilbury, 1996; Tilbury, 1993; UNESCO-UNEP, 1990), then "environmental education at primary, secondary and tertiary levels have an important role to play in the development of students who are capable of understanding and who are motivated to respond to

the issues which give rise to an environmental crisis” (Cutter & Smith, 2001, p. 47). In this context, it is an important issue that teachers who will train the next generation are known to have environmental literacy, pro-environmental attitudes, and behaviors. However, in the curriculums of most education faculties in Turkey, courses on environmental education are among the elective courses in curriculums of most departments. Furthermore, in some departments, such as mathematics education, the prospective teacher does not have any lessons about the environmental education.

Another important issue is related to the content and conduct of environmental education courses (Uzun & Sağlam, 2007). Providing environmental education with an understanding about a sustainable world at all levels of education, from primary education to university, can make people more conscious and more sensitive about the environment. Therefore, people can develop pro-environmental attitudes and behaviors (Çolakoğlu, 2010). As might be expected, there are different views about the proper role of environmental education. In this vein, some approaches have been developed such as education about the environment, education in (or through) the environment, and education for the environment (Cutter & Smith, 2001). As is clear from research on the subject, the content of courses dealing with environmental education in the majority of education faculties in Turkey, and teaching strategies used in this course are conducted as “education about the environment” (Ballantyne & Packer, 1996; Bentham et al., 2015; Hungerford & Volk, 1990; Özdemir, 2010; Stevenson, 2007; Ünal & Dımışkı, 1998). The primary objective of environmental education should be to educate individuals who do not hold their personal interest’s superior to those of nature, and who have a universal ethical understanding and a nature-centered world view. It is considered that these objectives can be achieved to a large extent through “education for the environment” (Cutter & Smith, 2001; Fien, 2000). In this context, if teachers at all levels of education are "trained for the environment", the education system can be expected to produce environmentally friendly citizens. Hence, the materialist values of environmentally sensitive citizens may not be strong. However, this assumption needs to be supported by future studies that focus on the relationship between materialist values and environmental values.

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