

Nature Connectedness and Landscape Preferences of Turkish Preservice Preschool Teachers

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ABSTRACT

The current paper had two aims, first to investigate Turkish pre-service preschool teachers' perceptions of different kinds of landscapes that can be used to achieve their educational goals, their ideas about the characteristics of these settings, and the contribution to children's education, the resource needs, motivations, and barriers they associated with these settings, and second to explore the possible relationship between nature relatedness of the participants and their outdoor setting type preferences (educational and personal). The participants were 300 pre-service preschool teachers from two universities in Turkey. The researchers used a landscape preferences questionnaire accompanied by 16 photographs of types of outdoor settings and human influence attributes to explore the landscape preferences of the participants. Additionally, a nature relatedness scale was used to investigate the participants' understanding of how human beings and nature are connected. The results showed that while the participants' educational preferences were generally in the categories of park and maintained settings, their personal preferences were water and natural areas. The results also revealed that although there were no significant differences in the preferences of the participants' educational landscape and their level of nature relatedness, there were statistically significant differences in their personal landscape preferences and levels of nature relatedness.

KEYWORDS

pre-service preschool teachers, landscape preferences, nature connectedness

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Introduction

Environmental education in the early years

The early childhood years are considered as critical in terms of environmental education since the development of a child's sense of care and respect for natural environment, including living things, as well as their appreciation for nature coincide with this period (Sobel, 1996). When children spend time in natural outdoor environments, they have opportunities to move freely and play (Fjørtoft, 2004; Rivkin, 1995), reconnect with the natural world (Bruyere, Wesson, & Teel, 2012), take risks (Waller, 2005), make noise, and be messy (Rivkin, 1998). Hence, various important skills such as reasoning, observation, concentration, and creativity can be stimulated in children in a natural environment because outdoor activities provide different kinds of hands-on experiences for children and help them gain awareness of events in nature (White, 2006). These positive aspects of outdoor experiences also offer advantages for teachers and the community (Ballantyne & Packer, 2002) since children's outdoor experiences contribute to teachers' endeavors to look for new ways to enhance children's learning and this can lead to them becoming more active and engaged citizens (Rickinson et al., 2004).

Being in natural outdoor environments also offers a variety of opportunities to meet the goals of environmental education in terms of reinforcing a child's caring attitude toward the environment (Rivkin, 2000) and these early positive experiences can result in taking on environmental stewardship in adulthood (Chawla, 1999). According to the research (e.g., Frantz et al., 2005; Nisbet et al., 2009), individuals have a tendency to protect the environment to the degree to which they feel concern about the natural world and value it. Environmental education can help to increase this tendency.

The literature provides good evidence of the multifaceted benefits of environmental education as well as the conditions that lead to these benefits in natural environments; however, in today's world children's access to free and direct experiences of playing in natural landscapes is very limited (Chawla, 2002; Louv, 2005; Rivkin, 1995). According to Satterthwaite (2000), in large cities, urbanization seems to be the main cause of the scarcity of natural areas and thus, this is one of the prevalent barriers preventing children from investigating in natural environments (Verheij, Maas, & Groenewegen, 2008). Teachers have a critical role in dealing with the negative impacts of urbanization by ensuring that outdoor play opportunities and natural experiences for children are incorporated into the school curriculum (Waller, 2007). Various researchers (e.g. Chawla, 1999; Littleddyke, 2002; Nordström, 2008) regard teachers as mentors who raise children's awareness about nature and suggest that teachers should provide direct engagement with the environment under the framework of structured environmental education programs by being a good role model and providing engaging field trips. In this way, children would not only acquire the necessary information but would also develop skills and attitudes that would lead them to respect the environment.

Teachers' educational use of outdoor environments and their landscape preferences

Since teachers have a variety of opportunities and the authority to encourage children to effectively engage in nature experiences, it is important to

understand how a teacher uses or manages outdoor settings (Malone & Tranter, 2003; Munoz, 2009) and their outdoor setting preferences (Jensen, 1993). In the international context, there are studies (Ernst, 2013; Ernst & Tornabene, 2012; Fagerstam, 2012; Maynard & Waters, 2007; Simmons, 1993; 1994; 1998) investigating this topic with some research concentrating on the barriers to environmental education and pointing out that teachers are not willing to integrate environmental education into their curriculum due a lack of training and inflexible curricula (Ernst, 2007; Maynard & Waters, 2007; Rickinson et al., 2004). Other issues were also raised including the dearth of financial resources needed for the children to visit natural settings and the difficulty in obtaining the necessary materials to use with children in these settings (Ernst, 2007; Mayeno, 2000; Rickinson et al., 2004). In terms of pre-service preschool teachers, we were able to find only one study that explored the teachers' preferences in outdoor settings serving as an educational learning environment for young children (Ernst & Tornabene, 2012) but to date, no study was found pertaining to the Turkish context related to these issues.

The relationship between teachers' landscape preferences and their connection to nature

There is growing body of evidence (i.e., Chakravarthi, Hatfield, & Hestenes, 2009; Sandell, Öhman, & Östman, 2005; Richardson, 1994; Stipek & Byler, 2004) that teachers' values and beliefs are highly related to their educational approaches as well as their classroom practices. Based on Stern's (2000) value-belief-norm theory, an individual's value orientations can be transmitted from the family or based on their educational and cultural background, and according to Chawla (2007), it is the values of the teachers and parents that have the most impact on young children's environmental values.

Within the framework of environmental psychology, researchers (i.e., Kaplan & Kaplan, 1989; Ruiz & Bernaldez, 1983; Ulrich, 1993) focused on the idea that individuals' general beliefs, attitudes, and values about nature together with their personal and social experiences in nature are the significant contributors to the forming of their landscape preferences. More importantly, in relation to the current research, an individual's level of connectedness with nature is considered to be highly affected by their general attitudes and values about the environment (Bruni & Schultz, 2010; Ernst & Tornabene, 2012). In support of this idea, Maller et al. (2005) stated that those with little or no connection with nature do not feel a part of it and tend not to value or show concern for the natural environment. This also applies to teachers since their preferences can affect their classroom arrangement and lesson planning (Sandell, Öhman, & Östman, 2005); therefore, it is important to determine pre-service preschool teachers' level of natural connectedness as well as their landscape preferences both educationally and personally.

In the Turkish context, there has been growing interest in environmental education research about teachers' views in general, but the studies mostly focused on primary and secondary school pre-service teachers' views and attitudes toward environmental education (Akbaş, 2007; Çobanoğlu, & Karakaya, 2009; Kahyaoğlu, 2009; Öztürk & Alkış, 2009). There is limited research about pre-service early childhood teachers' views and attitudes toward environmental education (Çabuk & Karacaoglu, 2003; Erten, 2005; Kandır, Yurt, & Cevher-Kalburan, 2012; Yurt, Cevher-Kalburan, & Kandır, 2010) and

outdoor activities (Alat, Akgümüş, & Cavali, 2012). However, no study was found related to Turkish pre-service early childhood teachers' landscape preferences, nature relatedness, educational and personal use of nature settings and possible relationship between nature relatedness of the participants and their outdoor setting type preferences. Therefore, the current study investigated Turkish pre-service preschool teachers' perceptions of different kinds of landscapes that may be used to reach their educational goals, their ideas about the characteristics of these settings, and the contribution to the children's education, the resource needs, motivations, and barriers they associated with these settings. The study also aimed to explore possible relationship between nature relatedness of the participants and their outdoor setting type preferences (educational and personal).

Method

Participants

The participants of the current study were 300 pre-service preschool teachers (n= 264, female; n= 36, male) pursuing their undergraduate studies at all levels in two different universities in Turkey. The majority of participants had neither participated in any kind of activity such as workshops or seminars (n= 262) nor regularly read printed material or watched TV programs (n= 249) related to the environment and nature in their undergraduate years prior to the study.

Research instruments

Landscape preferences questionnaire

To explore the pre-service early childhood teachers' personal and educational landscape preferences, a questionnaire developed by Ernst and Tornabene (2012) was used together with 16 photographs of water, forest, open field/grassy area, and park. In the original study, the photographs were taken in late spring and did not include any striking stimuli (such as people, objects, or animals), that would draw the participants' attention elsewhere and change his/her landscape preference (Kaplan, 1985). In the current study, in addition to monitoring the details in the photographs, the researchers prepared 45 identical sets of 16 photographs in booklet form to be used simultaneously with all members of each university class.

In the initial stage of the original instrument, as an initial step the questionnaire was translated into Turkish by the authors of the current study. Then, the authors met to discuss the translations and produced the final Turkish form of the questionnaire. The authors sent this translated version to five experts in the field of early childhood education and elementary science education and requested that they examine each item of the questionnaire in terms of content validity and ensure that it was culturally appropriate and the items were understandable. After receiving the opinions of the experts, both the original and translated forms of the questionnaire were sent to a native English speaker competent in Turkish to compare the appropriateness of all the items in original and adapted versions. When this process was completed, the final version of the questionnaire was prepared and used for main data collection.

During the data collection, first, the participants were asked to select three photographs of places they would personally most likely visit and three

photographs of places they would personally least likely visit from the photographs and then explain the reasons for their choices (See Table 1).

Table 1. Sample questions from the questionnaire investigating the teachers' landscape preferences analysis

Content of the questions	Sample questions
Personal landscape preferences	Which three places would you be <i>most</i> likely to visit?
Educational landscape preferences	Which three places do you feel are <i>most</i> conducive to meeting educational outcomes for young children?
Opportunities in most preferred landscapes	For each of the three photos you selected, please indicate what you would do with young children in a place like this.
Resource needs in most preferred landscapes	For each of the three photos you selected, please indicate what you feel you would need in order for an outing to this place to be successful for you and the children in your class.
Motivations to use natural landscapes in their professional life	What motivates you to want to utilize natural areas within young children's education?
Perceived barriers preventing the use of natural landscapes in their professional life	What do you feel would be the primary obstacle to your use of natural areas for educational opportunities with young children?

Note: 'young children' refers to the pre-service teachers' future students. For their personally and educationally most preferred places, the participants were expected to give reasons for their selections.

The preschool pre-service teachers were asked to select three settings they would visit most and three settings they would visit least with their future students and explain their reasoning for selecting the particular settings. The participants were also asked to indicate possible activities that could be undertaken with children in the natural outdoor settings of their choice as well as possible resources/materials they would need in such kinds of settings. Then, to understand their motivations for using natural landscapes with their students in their future professional life, the participants were asked to indicate the probability of using natural or maintained landscapes. Then, the participants were encouraged to comment on the probable obstacles to using natural landscapes with young children in their professional life. Lastly, the participants were asked to indicate their level of agreement about the benefits of natural experiences in terms of children's different developmental areas.

Nature relatedness scale

The second data collection instrument, the Nature Relatedness Scale, developed by Nisbet, Zelenski and Murphy (2009) ($\alpha=.87$) [adapted into Turkish by Karaarslan, Çakır, Ertepinar, and Şahin (2010) ($\alpha=.88$)] was used to assess the participants' understanding of how humans and nature are connected. This scale consists of three dimensions of individuals' natural connectedness with a

total of 21 items, namely cognitive (“I always think about how my actions affect the environment”), affective (“My feelings about nature do not affect how I live my life”) and experiential (“I don’t often go out into nature”) aspects (Nisbet et al., 2009). In the current study, the participants’ total nature relatedness scores are considered.

Data collection and analysis procedures

The necessary permissions were obtained from the faculties of education of both universities as well as the lecturers from whose classes the researchers were to gather data. During the data collection process, the researcher gave the participants brief information about the purpose of study and instructions on how to complete the questionnaire. Then, each participant was given a set of photographs. The implementation for each class took approximately 40 minutes.

The data was analyzed using both quantitative and qualitative research methods. For the former, the researchers used descriptive statistics, t-test and one-way ANOVA, and multiple regression analyses, and for the latter, the researchers independently read all responses to the open-ended questions. In order to determine the participants’ most and least landscape preferences, frequencies were calculated from the descriptive statistics. T-test and One-Way ANOVA were also conducted to assess whether there was a significant difference in participants’ nature relatedness scores and their human influence attributes and outdoor setting type preferences, respectively. Additionally, a multiple regression analysis was undertaken to determine the predictors of the participants’ use of natural settings with their future students. While the predictor variables referred to the benefits related to experience in nature, perceived difficulty in using natural settings, beliefs regarding nature experiences in the framework of formal school settings, intention to use maintained outdoor settings, and personal level of nature relatedness; the predicted variable was the participants’ use of natural settings. Considering the explanations of the selected predictor variables, recognition of the benefits related to experience in nature refers to the extent to which nature is important for the participants in terms of the children’s cognitive development, socio-emotional development, physical development, overall health and wellness, and appreciation for the environment. Moreover, the perceived difficulty in using natural settings indicated the possible obstacles that are important for the participants in preventing them from using natural settings to teach children. Beliefs regarding nature experiences in the framework of formal school settings is related to the participants’ ideas concerning the extent to which they believe nature experiences should be included in the school curriculum. The intention to use maintained outdoor settings reveals how much the participants would like to use maintained outdoor settings (i.e., landscaped school yards, mowed grassy areas, landscaped park settings, and playground) to achieve their educational goals with their future students. Finally, personal level of nature relatedness refers to the total score for the nature relatedness scale, which measures the extent to which the participants are connected with nature.

With regard to the qualitative data analysis, each researcher summarized the main points of the participants’ responses to identify common phrases, words, and sentences, and initial independent codes were used. Finally, the researchers compared their independent codes and reached a full agreement on similar codes.

Results

Nature relatedness of the participants

The participants' nature relatedness scores range from a low of 1 to a high of 5 with a mean score of 2.80 (SD=.29). The minimum and maximum values of the scores were 1.82 and 3.64, respectively.

Most and least preferred settings both educationally and personally

The three settings with the highest frequencies for educational preferences were *playground* (Setting 6, n=167), *pavilion in open woods* (Setting 7, n=107), and *open grassy area with several park benches* (Setting 11, n=101). Moreover, the settings with the lowest frequencies for educational preferences were *stream cutting through rocky outcropping forming small waterfalls* (Setting 14, n=128), *open forest with no path* (Setting 4, n=115), and *stream in wooded area with a narrow footpath* (Setting 15, n=113).

The three settings with the highest frequencies for most preferred personal outdoor settings were *small lake with calm water with small dock and shelter with canoes* (Setting 12, n=152), *pebbly shoreline of lake* (Setting 2, n=119), and *open natural area with a building in the background* (Setting 10, n=118). Additionally, the least personally preferred outdoor settings were *open grassy area with several park benches* (Setting 11, n=149), *playground* (Setting 6, n=117), and *open forest with no path* (Setting 4, n=108).

Additionally, to investigate whether the preferences of the participants were related to their levels of nature relatedness, the participants' most preferred educational and personal preferences were recorded according to the outdoor setting type. Additionally, the particular preferences of the participants were also recorded according to the human influence attribute including natural or maintained settings. One-way ANOVA was conducted to explore whether there was a significant difference in the participants' nature relatedness scores and their preference of outdoor setting type (Table 2).

Table 2. One-Way Analysis of Variance (One-Way ANOVA) Between Nature Relatedness Scores & Outdoor Setting Type Preferences

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	1262.6	3	420.87	3.33	.02
Within Groups	37362.55	296	126.23		
Total	38625.15	299			
Between Groups	878.58	3	292.86	2.29	.08
Within Groups	37746.57	296	127.52		
Total	38625.15	299			

DV: Nature Relatedness

Additionally, an independent t-test was undertaken to determine if there was a significant difference in participants' nature relatedness scores and their human influence attributes. The results showed that there was no significant difference between the participants' educational outdoor setting type preferences and their level of nature relatedness, $F(3,296)=2.29$, $p=.08$. However, the results also showed that there were statistically significant differences in the participants' personal outdoor setting type preferences and their level of nature relatedness, $F(3, 296)=3.33$, $p=.02$ (See Table 2). Moreover, there were no significant differences between the participants level of nature relatedness and their human influence attribute, $t(298)=.58$ and $t(298)=.20$, respectively (See Table 3).

Table 3. Independent Sample t-test for Nature Relatedness Scores by Human Influence Attributes (natural and maintained)

		Levene Test for Equality of Variances		t-test for Equality of Means					95 % Confidence Interval of the Mean	
		F	Sig	t	df	Sig. (2-tailed)	Mean	Std. Error Difference	Lower	Upper
Total Nature Relatedness Scores	Equal variances assumed	.29	.58	3.25	298	.001	4.64	1.43	1.83	7.45
	Equal variances not assumed			3.45	179.84	.001	4.64	1.34	1.99	7.29
	Equal variances assumed	1.62	.20	1.25	298	.21	1.64	1.31	-.94	4.22
	Equal variances not assumed			1.26	297.298	.21	1.64	1.31	-.93	4.22

Characteristics of educationally conducive outdoor settings

In order to gain insight into the participants' views about the characteristics of the most and least preferred settings, their comments were elicited on the selected particular settings being the most or least conducive in reaching their educational goals (see Table 4). The preference for Setting 6 being preferred as the educationally most conducive was related to opportunities for free movement in the playground. Moreover, the most frequent reason for selecting Setting 14 as the educationally least conducive was associated with

possible safety hazards. The examination of the most frequent reason underlying Setting 12 being the participants' most preferred personal settings was related to a sense of calmness and peace. On the other hand, the most frequent reason for Setting 11 being the least preferred personal setting was lack of attractiveness.

Table 4. Characteristics of participants' most and least preferred educational and personal outdoor setting

Reasons for <i>most</i> preferred (frequency)	Reasons for <i>least</i> preferred (frequency)
<i>Educational preferences</i>	
Opportunities to move freely (56)	Safety hazards (56)
Enjoyable for children (45)	Inappropriate ground for children to move around on (17)
Safe (39)	Insufficient stimulus in the environment (3)
Opportunities for unstructured learning in nature (21)	No place to relax (1)
<i>Personal preferences</i>	
Give a sense of calmness and peace (42)	Not attractive (53)
Green space including trees (38)	Not natural (16)
The presence of water (35)	Too quiet (15)
Beauty of the scenery (19)	Lack of trees (13)
The place that I imagine living in (6)	Not appropriate to relax (8)
Appropriate for engaging in different kind of activities (6)	
The presence of shelter (4)	

To investigate the participants' ideas about the characteristics of educationally conducive outdoor settings in more detail, the participants' responses to open-ended questions in terms of both outdoor setting type and human influence attribute were analyzed. Regarding the responses for educationally conducive settings, while park (outdoor setting type) and maintained (human influence attribute) were perceived as the most conducive to achieving educational goals; water (outdoor setting type) and natural (human influence attribute) were perceived as the least conducive to attaining these goals (see Table 5). For example, participant pre-service teachers described these settings as:

“Playgrounds are one of the most enjoyable places for children. Children's communication skills could develop through playing and spending time with other children in playgrounds” (P 79).

“Playgrounds offer children fun and contribute to their motor development since they provide children with a variety of physical activities such as running, climbing, or jumping” (P 62).

Additionally, some participants gave reasons why Setting 14 was considered the least conducive for educational goals. For example,

“The place was rough and disorganized, which will cause accidents for children and make it difficult for teachers to manage the children” (P 53).

“It can be considered as a difficult place for children to move freely” (P 157).

Table 5. Participants’ preferences by outdoor setting type and human influence attribute

	Frequency of participants selecting setting as an <i>educational</i> preference	Frequency of participants selecting setting as a <i>personal</i> preference
<i>Outdoor setting type</i>		
Park	156	60
Forest	70	58
Water	47	136
Open field/grassy area	27	46
<i>Human influence attribute</i>		
Maintained	214	147
Natural	86	153

According to the participants’ responses, the most preferred personal setting was water (outdoor setting type) and natural (human influence attribute) and the least preferred personal setting was an open field grassy area (outdoor setting type) and maintained (human influence attribute) (see Table 5). Those preferences were consistent with the participants’ comments about the characteristics of educationally conducive settings (See Table 4) which included safe, but fun opportunities for free movement, and their personal preferences, which involved a sense of calmness and peace, natural beauty and the presence of water. Some participants explained their personal preferences as follows:

“In this photograph, the dominance of green struck me. I think that I could feel more at peace and spend some good times in such an environment. Also, this place stimulates me to explore the environment” (P 62).

“The place seemed to be a natural and green area and looking at the picture gives me a feeling of relaxation” (P 73).

Additionally, some participants gave reasons why their least preferred personal setting was an open field grassy area (outdoor setting type) and maintained (human influence attribute). For instance,

“I selected that place because it was not an unfamiliar place for me. I have a good chance of seeing such places in Turkey” (P 157).

“I don’t think the place is attractive” (P 42).

Educational affordances and resource needs

The activities most frequently related to the educationally most preferred three outdoor settings of the pre-service preschool teachers were coded as structured and unstructured learning about nature as well as unstructured free play for physical or health benefits. The remaining coding together with the calculated frequencies is given in Table 6.

Table 6. Frequency of possible activities that can be undertaken in the educationally most conducive settings**

Activities	Park	Forest	Water	Open field /grassy areas	Total by activity (<i>f</i>)
Structured learning about nature	40	100	101	70	300
Unstructured/Free play for physical/health benefits	214	9	5	29	257
Unstructured learning about nature	35	112	39	46	232
Structured play for physical health benefits	68	20	8	6	102
Art activities	24	9	10	7	50
Math	20	10	7	7	44
Picnic	28	8	2	6	44
Reading activities	28	5	3	6	42
Drama	25	6	2	8	41
All activities	10	1	2	2	15
Resting	9	-	1	-	10
Camping	-	3	1	1	5
Project	-	2	1	1	4
Protecting from inappropriate weather	1	-	-	1	2

** Each participant could give more than one suggestion for activities.

Additionally, the requirements that participants felt were necessary to achieve educational outcomes in the settings they selected as the educationally most conducive were mostly related to safety, materials, and content/information (Table 7).

Table 7. Required elements for the participants' to achieve their educational outcomes in their most preferred educational settings

	Required to achieve their educational outcomes (f)
<i>Safety related</i>	
Appropriate and/or spare clothes and/or shoes	108
Extra adult to supervise	52
Safety gear (such as life jacket, kneepads and arm bands)	47
First aid kit	41
Confined area for play/activities	11
Prior information about safety rules	10
Extra teacher attention	8
Good weather	4
Background knowledge of classroom management	4
Less children in the group	3
<i>Materials</i>	
Field equipment specific to activity	300
Only nature without any specific material is sufficient	67
Picnic supplies	63
Camera	36
Mat to sit on	20
Bags/jars for collecting nature items	19
Activity/lesson plans	17
Boat	7
Tent	6
Map/compass	5
Backpack	5
<i>Content/Information related</i>	
Naturalist to accompany the group	15
Prior knowledge/background information enhanced for children	9
Prior knowledge given to teachers about settings	7

Motivations for and barriers to the use of natural outdoor settings

The participants' motivations for using natural outdoor settings with their future students mostly arose from the appropriateness of the natural places and materials for children's development and well-being, the opportunities for hands-on learning in such kinds of settings, and the appropriateness of those places for activities (Table 8). This can be seen the following extracts:

"I believe that children learn best through hands-on experiences. Those outdoor settings could offer opportunities for children to explore and learn by themselves" (P 69).

"I think today's children are detached from nature and mostly spend their time indoors. I also think that I could get children to take responsibility to protect the environment through natural activities in such kind of settings" (P 46).

Other participants mentioned the lack of parental and administrative support, safety concerns, and scarcity of such settings nearby as barriers to use natural outdoor settings (See Table 8).

“I think there are three basic barriers to bringing children into natural settings: The difficulty of taking sufficient safety measures, obtaining permission from parents and school managers, and the availability of natural settings” (P 90).

Table 8. Motivations for and barriers to the use of natural outdoor settings

	Frequency
Motivations	
Nature and natural materials are appropriate for a child development/health	61
Hands-on learning	20
Appropriate for activities	14
Fostering creativity	9
Increasing sensitivity to protect nature	7
Opportunity for learning in alternative settings	7
Humans are a part of nature	6
Desire to be a teacher in natural settings	4
Rich natural materials	3
Enjoyable settings for children	1
Barriers	
Lack of parent support	25
Lack of school administration support	18
Safety concerns	17
Scarcity of natural areas around us	15
Difficulty of drawing children’s attention to the subject in natural settings	3
Economic constraints of the school	2

Recognition of benefits of experiences in nature and perceived barriers

The participants rated five statements with regard to the benefits of experiences in nature for young children ranging from 1 indicating strong disagreement on the benefits to 5 representing the strongest agreement. A descriptive analysis of the data revealed that the participants were in strongest agreement with the physical benefits of experiences in nature ($M=4.85$, $SD=.39$). Considering the other developmental areas, in general, participants agreed on the benefits of experiences in nature in terms of children’s development of environmental appreciation ($M=4.82$, $SD=.43$), health and well-being ($M=4.79$, $SD=.45$), cognitive development ($M=4.78$, $SD=.45$), and socio-emotional development ($M=4.72$, $SD=.47$).

In order to investigate perceived barriers to using natural outdoor settings, the participants were asked to rank their beliefs regarding the use of nature experiences within the framework of a formal school setting on a scale ranging from very strong disagreement to very strong agreement ($M=4.68$, $SD=.58$). The data analysis revealed that although pre-service teachers were generally in

agreement in terms of their beliefs about the use of nature experiences within the school curriculum, they still had attitudinal barriers to using the natural environment in school settings.

Intentions regarding and predictors of the use of natural settings

While the participants indicated that they would be likely to use natural outdoor settings with their future students ($M=3.34$, $SD=.82$), they also stated that they would be slightly more likely to use maintained outdoor settings ($M=3.65$, $SD=.77$).

Moreover, the significant predictors of the intention to use natural settings with future students were determined using a multiple regression analysis of the following independent variables; recognition of the benefits related to experience in nature, perceived difficulty in using natural settings, beliefs regarding nature experiences in the framework of formal school settings, intention to use maintained outdoor settings, and personal level of nature relatedness. The regression model gave significant values, $F(5,294)=8.66$, $p<.0005$, with a set of variables as predictors explaining almost 13% of the variance in the teachers' intention to use natural settings according to the following four predictors of intention being significant; perceived difficulty in using natural settings ($\beta =.19$) beliefs regarding nature experiences in the framework of formal school settings ($\beta =.14$), intention to use maintained outdoor settings ($\beta =.14$), and personal level of nature relatedness ($\beta =.12$) (See Table 9).

Table 9. Summary of Multiple Regression Analysis for Variables Predicting the Participants' Intention to Use Natural Settings

Predictor Variables	B	SE(B)	β	ΔR^2
Model 1				.13
Perceived difficulty in using natural settings	.20	.06	.19	
Beliefs regarding nature experiences in the framework of formal school settings	.19	.09	.14	
Intention to use maintained outdoor settings	.15	.06	.14	
Personal level of nature relatedness	.01	.01	.12	

$p<.0005$

Discussion and Implications

Educational-personal landscape preferences and characteristics of conducive outdoor settings

The results indicated that the participants did not agree on particular settings in terms of their most preferred educational and personal settings. For the outdoor setting type preferences, their educational and personal preferences did not intersect on any particular type of landscape; their educational preferences were in the park category whereas their personally preferred landscapes were in the water category. The participants' choice of a park setting containing a playground is supported by another finding of this study, which

showed that the teachers recognized the importance of the physical development of children through the opportunities for free movement and unstructured free play in playgrounds. In addition, their educational preferences seemed to be mostly related to the settings' appropriateness/inappropriateness or their feelings about being secure/insecure. In particular, the participants' explanations regarding their preferences of the educationally most conducive settings were consistent with their reports on the benefits of nature experiences. In fact, while the participants' most preferred settings can be explained with reference to the appropriateness of those settings for children's free movement, it is important to note that the physical benefits of nature experiences outweigh other gains (Fjørtoft, 2001). Furthermore, the ease of class management in the environments with limited boundaries might be a reason for that choice (Mulryan-Kyne, 2014). Since in Turkey most urban parks contain playgrounds it is likely that the participants are aware of them and thus the play opportunities they afford. Considering the human influence attribute, the results are compatible with the findings of the study by Ernst and Tornebene (2012) in terms of maintained settings being the most appropriate educational settings and natural settings as the participants mostly preferred personal settings. The participants' educational preferences can also be explained by the findings of Plevyak (1997) Smith-Sebasto and Smith (1997) who pointed to teachers' lack of knowledge about teaching environmental education due to insufficient training. The preferences of the pre-service teachers could be related to the dearth of compulsory environmental education courses in early childhood teacher education programs in Turkey. Only the obligatory course, 'Teaching Science in Early Childhood', addresses some environmental and natural issues (HEC, 2007). The content, however, varies based on the course instructor's preferences (Olgan, 2015). To improve pre-service teachers' teaching ability in the natural environment, more courses covering natural and environmental issues should be included in teacher education programs. Moreover, providing more hands-on experiences in nature would be helpful for teachers to transfer theoretical knowledge into classroom practice.

The results also showed that the pre-service teachers in the current study mostly preferred natural areas including water as personal settings concentrating on issues of attractiveness of the natural elements (e.g., green spaces and water), and giving a sense of calmness and peace. While Ulrich (1983), and Kaplan and Kaplan (1989) stated that people tend to prefer landscapes in which there is water because of its direct or indirect association with sustaining life, other researchers emphasized the relaxing effect of these places reducing the stress levels of people (Hartig, 2004; Ulrich, Simons, Losito, Fiorito, & Miles, 1991; Van den Berg, Hartig, & Staats, 2007). Also, Bouroussa (1990) and Han (2007) stated that preferences might vary based on the cultural group they belong to.

The results also revealed that the participants' least preferred educational setting and personal settings were in the category of water (natural) and park (maintained), respectively. This result could be related to the familiarity of those settings for the participants. According to Bixler et al. (1994), and Park, Shimojo and Shimojo (2010), people have an inclination to prefer settings that are familiar to them. In Turkey, in 2014, 73% of the population lived in urban areas (World Bank, 2015); therefore, the pre-service teachers may not be familiar with

the use of natural settings. This lack of personal experience may affect their preferences.

The results of the study also showed that while there is no significant difference in participants' nature relatedness scores according to the educational outdoor setting type preferences and human influence attribute, there is a statistically significant difference in their nature relatedness scores related to the preferences for personal outdoor settings. Considering this result, it seems that the participants' personal preferences have an impact on their levels of nature relatedness. Nisbet et al. (2009) also found that an individual's nature relatedness is positively related to the time spent in nature. Therefore, there is a need to increase pre-service teachers' time spent in nature both in their educational and personal lives. When their level of time spent in natural environment is increased, their bond with nature would be stronger and this could lead to a greater willingness to engage in teaching in natural settings.

Moreover, the significant predictors of intention to use natural settings with participants' future students were determined using multiple regression analysis. The results revealed four independent variables (perceived difficulty in using natural settings, belief regarding nature experiences in the framework of formal school settings, intention to use maintained outdoor settings, and personal level of nature relatedness) that significantly contributed to the participants' future use of natural settings with children in their professional lives.

In order for the participants to increase their understanding of the value of spending time in outdoor settings for children's learning and development, pre-service teachers should be made aware of experiences that these places can offer young children. Thus, ample opportunities in teacher education programs including well-designed practicum experiences would also be beneficial to increase prospective teachers' intentions to use both natural and maintained outdoor settings.

Educational affordances and resource needs

Based on the participants' reports about their educationally most preferred settings, almost all mentioned the appropriateness of such settings for unstructured as well as structured learning activities about nature (including science activities related to animals and plants). Similar results were highlighted by Torquati et al. (2013) in that pre-service teachers perceive natural places as appropriate for unstructured science activities, including observation of animals and plants, caring for plants, or gardening. This could be due to the content/nature of the science activities and first-hand opportunities including field trips provided in teacher education programs. According to Athman and Monroe (2002) as well as Steven and Andrews (2006), field trips could offer pre-service teachers first-hand experience and information regarding science and environment. Therefore, pre-service teachers could be informed about how effective field trips to natural places can be organized to encourage children to closely observe natural environments around them within the context of science and environmental education. Similar to the value of unstructured learning activities, researchers emphasize that it is important for teachers to use age-appropriate structured learning activities in line with the objectives of their programs (Gregg, 2009; Rickinson et al., 2004).

When the participants of this study were asked to indicate their ideas about resource requirements related to their educationally preferred settings, they mentioned safety related needs, materials, or content related needs. In terms of the participants' content related needs, Torquati et al. (2013) supported the results of the current study in that pre-service teachers should have basic knowledge of science and nature in order to feel confident and comfortable in answering children's possible questions in such settings. The authors also asserted that if the teachers are familiar with the potential settings they could visit with their students, they would be able to fulfill their educational goals for children (Torquati et al., 2013). Furthermore, Helm and Katz (2010) emphasized that teachers need to be prepared to teach in natural settings to encourage children's sense of wonder, which is important to draw children's attention to nature-related activities.

Motivations/future intentions for the barriers to the use of natural outdoor settings

The results indicate that the participants have more future intentions to use maintained outdoor settings than natural settings with their future students. Contrary to our results, Simmons (1998) emphasized teachers' inclination to use natural settings (e.g. rivers, ponds, and marches, or deep woods) over maintained settings to educate children. Similarly, Norðdahl and Jóhannesson (2014) found that teachers preferred to undertake teaching activities in natural outdoor settings (e.g. forest, grassy area, seacoast, or tree garden) beyond the school ground. Inconclusive research results may indicate that teachers' varied preferences depend on opportunities that these places could offer for the teachers such as being able to teach in variety of learning domains such as math, language, or cooking, (Norðdahl & Jóhannesson, 2014); ease of controlling children within limited boundaries, (Ernst & Tornabene, 2012) and children being able to play in natural environment (Norðdahl & Jóhannesson, 2014).

Moreover, the participants also concentrated on the barriers to the use of natural outdoor settings. These barriers were essentially related to the lack of parental and administrative support, safety concerns, and scarcity of nearby natural settings. In contrast with the work of Ernst and Tornabene (2012), the current study found the lack of parental and administrative support was not seen as large a barrier as lack of access or the need for transportation by the teachers. Different studies have cited many other barriers to using natural environments with children including; lack of time (Christenson, 2004; Ernst, 2013; Rickinson et al., 2004), inappropriate weather (Ernst, 2013; Maynard & Waters, 2007), the need for extra adult for supervision of children (Ernst & Tornabene, 2012), and lack of confidence in teaching in natural settings (Fagerstam, 2012; Torquati et al., 2013; Simmons, 1998). Ernst (2012) suggested that professional development workshops for in-service teachers would allow the sharing of ideas concerning overcoming these and other obstacles.

Lastly, almost all the participants stated that their educationally preferred settings would provide children with unstructured free play opportunities that contribute to their physical development and well-being. However, according to Davies (1996), preschool teachers have limited perceptions about the potential benefits of activities in natural outdoor settings, perceiving them as only contributing to the children's social and physical development. Such perceptions

seem to be a barrier for teachers to implement a variety of activities in outdoor settings (Chakravarthi, 2009). Thus, the education of pre-service teachers should contain information concerning the impact of various outdoor environments on children's cognitive, social and emotional development (Ernst and Tornabene, 2012).

Conclusion

The findings of this study showed that the participant pre-service teachers' landscape preferences differ in terms of their educational and personal outdoor setting type preferences. In fact, they selected playgrounds as their most preferred educational preferences since such environments allow children some degree of autonomy. Thus, spending time in natural outdoor settings (i.e., school gardens or local outdoor environments) where children can move freely should be an indispensable part of a child's everyday life. However, pre-service teachers should be aware of the need to ensure that the children are safe and that parents are informed about outdoor activities. In addition, effective teacher training can have an impact on the motivation of pre-service teachers to plan and practice outdoor activities in natural settings. In particular, in teacher training programs, key points can be emphasized that can increase pre-service teachers' awareness, willingness, and readiness to design and practice outdoor activities in natural settings in their professional life. These points could include the contributions of hands-on experiences in natural settings and the positive effects of being in nature/using natural materials on children's whole development and learning, the importance of increasing both teachers' and children's familiarity to natural outdoor settings through frequent visits, and learning to design and practice appropriate outdoor activities.

Disclosure statement

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