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Investigation of Turkish Elementary School Students' Environmental Awareness

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Abstract

This study aimed to examine the environmental awareness of Turkish primary school students in the context of some demographic variables. The study was carried out with the general survey method. An online questionnaire was used as a data collection tool due to the Covid 19 pandemic conditions during the study. The first part of this survey form included demographic questions about gender, grade, household income, mother's graduation, and father's graduation. The second part included the 5-Likert type 21-item Elementary School Environment Awareness Scale (ESEAS). The original ESAS developed by Yıldız Yılmaz and Mentiş Taş (2017) consists of 31 items. As a result of a pilot study, it was decided to exclude 14 items from the original scale. The exploratory factor analysis result revealed that the scale showed a structure with five sub-dimensions (ecocentric, nature responsibility, anthropocentric, environmental knowledge, and hedonistic). Two hundred sixty primary school students at the 2nd and 4th-grade levels participated in the study. The present study's results, which examined elementary school students' environmental awareness levels, showed that the null hypothesis was accepted in most scores related to scale factors. These results show that the students who participated in the study tended to have information about the environment and the factors that threatened the environment, to be sensitive to nature, and to be ready to sacrifice to solve environmental problems. The analysis results show that the participants agreed with the statements in ecocentric, nature responsibility, ecological knowledge, and hedonistic sub-dimensions. At the same time, they disagreed with the views of the anthropocentric sub-dimension. It was determined that there was a significant difference between the groups in the context of some demographic variables.

Keywords: Turkish Elementary School Students, Environmental Awareness, Elementary School Environment Awareness Scale (ESAS)

1. Introduction

There is a two-way relationship between humans and the natural environment. While humans affect the natural environment, the natural environment also affects human life. Since the human population was low in the past, the negative impact of human intervention on nature for food and energy sources was relatively low. Over time, with the increase in human population and the change in people's consumption habits, natural resources began to decrease and even disappear (Nyika, & Mwema, 2021; Tekiroğlu, & Hayır Kanat, 2021). The deterioration of ecological balance threatens human life and the existence of natural plants and animals (Kurt Gökçeli, Tarkoçin,

& Bilmes, 2021). Although many solutions are offered for various environmental problems that have occurred over time, it is crucial to take measures to prevent them before they occur (Şimşekli, 2004). One of the most critical factors in achieving sustainable development is education. Education is the crucial point that provides the evolution of humans' awareness of the environment and environmental problems and the development of the consciousness, attitudes, and skills they should have to solve environmental problems (Chapman, & Sharma, 2001). For this reason, any training or activity in the field of environmental education emerges as an alternative way to solve the environmental problems that occur (Onion, Wongchantra, & Bunnaen, 2021). Thanks to the development of environmental awareness through education, people will find solutions to live in a safer and healthier environment. According to the Turkish Language Association, awareness is awareness of an event, phenomenon, or situation (TDK, 2022). Although awareness is explained as perceiving the relationship between individuals and the outer world, this relationship can be defined not through verbal or mental perception but as visual perception and perception of the beings in the environment (Yeşilyurt, Özdemir Balakoğlu, & Erol, 2020). The environment is where individuals are in close or distant relationships and constantly interact. Environmental awareness is defined as knowing the environment and the factors that threaten the environment, being sensitive to the environment, and being ready to make sacrifices to solve environmental problems (Grodzińska-Jurczak, Stepska, Nieszporek, & Bryda, 2006). Ecological awareness is humans' general knowledge and consciousness against positive and negative changes in their immediate or distant environment (Gadenne, Kennedy, & McKeiver, 2009). Raising environmentally friendly generations is a critical issue (Çetin, & Nişancı, 2010). The environment in which individuals are born affects their behaviors, attitudes, and cultural development in all areas of their lives (Vatansever Bayraktar, & Fırat, 2020). In particular, the experiences and knowledge gained from children's family environment in the early stages of their lives affect their behavior in their later years. Therefore, the importance of both formal and informal environmental education emerges at an early age.

Environmental education is one of the most critical issues for protecting, improving, and sustaining the natural environment (Suarlin, & Ali, 2020). Environmental education is a rapidly developing and dynamic subject that gives people a different perspective on nature and provides information about the duties and responsibilities of people in protecting living beings in nature (Puri, Vel, Manoharan, James, & Joshi, 2021). In this context, environmental education could contribute to developing ecological awareness, skills, and positive attitudes in individuals of all ages, starting from preschool education.

The search for solutions to gradually increasing global environmental problems has necessitated some initiatives at the international level. In this context, the decisions taken at the Tbilisi Conference held in 1977 in cooperation with UNESCO and the United Nations Environment Program are essential. The Tbilisi Declaration emphasized the importance of education in protecting and improving the environment. According to this declaration, environmental education objectives were determined as environmental awareness, environmental knowledge, attitude, skills, and participation. Environmental education aims to raise awareness and consciousness about the environment in both urban and rural areas, provide each individual with the knowledge, attitudes, and skills they need to protect and improve the environment and contribute to society's positive behaviors towards the environment (URL 1).

The findings of academic studies on environmental education are essential sources of information for those who develop education policies and curricula. Every day, new studies are carried out on society's and students' environmental education at different levels (Mutisya, & Barker, 2011). Stanišić and Maksić (2014) examined the curricula of the same countries and at various educational levels. The researchers reported that environmental issues in the programs they studied were mainly theoretical, while practical activities were missing or absent. It is understood that the Ministry of National Education (MEB) of Türkiye emphasized including environmental education in the 2002 and 2006 preschool curricula. At the primary school level, there were topics related to environmental education in the context of different courses in the 1968, 1992, 2000, and 2004 curriculums (Dindar & Taneri, 2011). At secondary and high school levels, environmental education has been included in the curriculum since 1992 (Ünal & Dımişki, 1999). In the curricula implemented in Turkey between 2005-2018, environmental education was mainly in the content science of life and science and technology courses at the elementary education level. Thirty-eight of the total 290 instructional goals in the science of life curriculum and 36 of the 203 in the Science and Technology curriculum were related to environmental education (Akınoğlu, & Sarı, 2009). In current educational programs that changed in 2018 in Turkey, environmental education objectives

have increased. For example, 43 of the 148 instructional goals in the Life Studies curriculum and 26 of the 82 acquisitions in the Science curriculum are related to environmental education. In addition, it was recommended to implement activities that enable students to interact directly with the environment in these framework programs (MEB, 2013; MEB, 2018).

Studies conducted in the field of environmental education show that a qualified environmental education given at an early age contributes to students' feeling self-confident, developing creativity skills, empathizing with nature, creating awareness to protect the natural environment and respecting the nature (Caiman, Hedefalk, & Ottander, 2022; Zhakupova, Mankesh, Kyakbaeva, Karimova, & Omarova, 2022). Through child-centered environmental education, children can develop basic skills such as recognizing nature, solving problems faced in daily life, and understanding the relationship between them and nature (Yıldız Yılmaz, 2019). It is predicted that individuals who are guided to the environment and environmental problems and understand nature better at an early age will develop awareness towards wildlife and show environmentally friendly behaviors and attitudes all their lives (Ata, 2018; Körükçü, & Güngör, 2021; Yıldız Yılmaz, & Mentiş Taş, 2017). According to Erdem, Meriç, and Meriç (2019), individuals with high environmental awareness can develop more conscious solutions to solving environmental problems. Thanks to environmental education in early childhood, it is predicted that individuals who take charge and have a say in different sections of society will have environmentally friendly behaviors and attitudes (Jinliang et al., 2004). Therefore, education in schools at all levels has a significant potential to improve children's environmental awareness (Hesami Arani, Bagheri, & Ghanaian, 2016).

Some studies in the field of environmental awareness reported that there was no qualified education on environmental awareness from primary school to secondary school (Jinliang et al., 2004; Purwanti, Gunarhadi, & Musadad, 2019). Some studies claimed that the activities and materials in the curriculum were insufficient for the development of environmental awareness (Purwanti et al., 2019), and using different teaching techniques improved environmental awareness levels (Katoppo, Irwandi, Ng, & Lie, 2020). On the other hand, Rogayan and Nebrida (2019) pointed out that environmental awareness affects the search for solutions to environmental problems. In this context, it was reported that the environmental awareness of students studying in ecology-based schools was higher than students studying in traditional schools (Meiboudi, Omidvar, Enayati, & Rashidi, 2013; Wihardjo, Hartati, Nurani, & Sujarwanta, 2017), and socioeconomic level, living environment impacted knowledge and awareness (Korhonen, & Lappalainen, 2004; Fisman, 2005; Mutisya, & Barker, 2011).

In studies focusing on the environmental awareness level of primary school students, it is noteworthy that demographic variables such as parent's education level, socioeconomic level, animal nutrition, plant breeding, class level, teaching method, and the number of siblings were taken as the basis (For example; Özden, 2008; Baş, 2012; Yıldız Yılmaz, & Mentiş Taş, 2018; Çelikler, Aksan, & Yenikalaycı, 2019; Erdem, Meriç, & Meriç, 2019; Vatansever Bayraktar, & Fırat, 2020; Başaran, & Erol, 2021). In this context, the aim of this study conducted during the COVID-19 pandemic, which became a global problem after 2019, was to examine the environmental awareness levels of Turkish elementary education students in the Samsun province sample. The null hypothesis (H_0) of the study is as follows:

"There are no statistically significant differences between groups in their scores from Elementary School Environment Awareness Scale (ESEAS) in terms of gender, household income, grade, mother's graduation, father's graduation."

2. Method

This study was carried out in the general survey mode in the 2021-2022 academic year. The study's sample was determined by convenient sampling due to the pandemic conditions during the data collection. Convenience sampling is a method that provides convenience in terms of cost and time (Baltacı, 2018). The online survey form was used as a data collection tool. The teachers who agreed to participate in the study shared the data collection tool with their students in their online classrooms, and they got feedback from the students who volunteered to respond. Table 1 shows the study group's descriptive analyses regarding some demographic variables (gender, grade, household income, and parental graduation). The study group consists of a total of 260 students, 54%

(n=141) female, 46% (n=119) male, who were studying in 2nd grade (n=40, 15%), 3rd grade (n=98, 38%) and 4th grade (n=122, 47%).

Table 1: The demographic characteristics of the study group

Groups/gender	Female		Male		Total		
	n	%	n	%	n	%	
Grade Level	2nd grade	24	9	16	6	40	15
	3rd grade	48	19	50	19	98	38
	4th grade	69	27	53	20	122	47
Household income	0-3000	48	18	37	14	85	33
	3001-6000	49	19	46	18	95	37
	6001-9000	28	11	19	7	47	18
	9001 +	16	6	17	7	33	12
Mother's graduation	Out of school	5	1,5	1	0,5	6	2
	Primary school	30	12	22	8	52	20
	Junior high school	24	9	17	7	41	16
	Senior high school	47	18	35	14	82	32
	University	35	13	44	17	79	30
Father's graduation	Primary school	28	11	19	7	47	17
	Junior high school	22	8	18	7	40	15
	Senior high school	42	16	36	14	78	30
	University	49	19	46	18	95	37
	General total	141	54	119	46	260	100

The first part of this survey form includes demographic questions about gender, grade, household income, and mother's and father's graduation. In the second part, there was the Primary School Environmental Awareness Scale (PSEAS) consisting of 21 items in a five-point Likert type (completely agree, agree, neutral, disagree, totally disagree) about the participants' environmental awareness. The original PSEAS was developed by Yıldız Yılmaz and Mentiş Taş (2017), and it includes 35 items and four subdimensions (life in nature, recyclable energy sources, and their use, environmental responsibility, continuity of living things). The researchers stated that the validity and reliability study of the scale was limited to schools in the center of Konya province, and they recommended that the scale be applied to different samples to compare the results. Cronbach's alpha reliability coefficients of the scale were reported in the studies on Turkish primary school students in which ESEAS was used as a data collection tool (Çelik, 2020; Çelikler, Aksan, & Yenikalaycı, 2019; Erdem et al., 2019; Vatanserver Bayraktar & Fırat, 2020). However, the scale's validity study was not conducted for different samples in these studies.

In the months before online education started due to the pandemic, a face-to-face pilot study was conducted with 70 elementary school students in the 2nd, 3rd, and 4th grades in elementary education schools in the center of Samsun by using simple random sampling. As a result of the exploratory factor analysis of these data, it was decided to delete 14 items from the scale since their factor loadings had high values in a few factors. Cronbach's Alpha coefficient for 21-item ESEAS was 0.84, and coefficients for the 21 items were found to vary between 0.828 and 0.841. The result shows that the scale is highly reliable (Kalaycı, 2014).

Exploratory factor analysis (EFA) was conducted to determine the construct validity of ESEAS. It is recommended that the variables show normal distribution, control for multivariate normality, and at least two variables under each factor to apply EFA (Çakır, 2014). The KMO test value of the scale was 0.56, and the Bartlett Sphericity test value was significant ($X^2=2362,795$; $p \leq .01$). The results of this analysis showed that the data matrix was suitable for factorization and the data had a multivariate normality distribution.

After the suitability of data for factor analysis was confirmed, exploratory factor analysis (EFA) was conducted using Principal Components Analysis and Varimax Rotation methods to examine the scale's factor structure. This analysis showed that five components explained 61.97% of the total variance for 21 items and had an eigenvalue

above 1%. The load acceptance level of all items was between 0.52 and 0.90, and the difference between the load values of the two items was more significant than 0.1.

As a result of exploratory factor analysis, the factor loadings of 8 items in the first sub-dimension were between 0.83 and 0.52, and the factor loadings of 4 items in the second sub-dimension were between 0.80 and 0.56. the factor loadings for three items in the third sub-dimension were found between 0.90 and 0.84, while it for three items in the fourth sub-dimension were between 0.82 and 0.54, and three items in the fifth sub-dimension were between 0.65 and 0.52.

Scale dimensions were named as in Table 2, considering the expressions in each sub-dimension: Ecocentric (E), Nature Responsibility (NR), Anthropocentric (A), Environmental knowledge (EK), and Hedonistic (H).

Table 2: Subdimensions and factor loadings of ESEAS

	Factors and items	Factor Loadings
E	M1 6	Unnecessary water consumption should not be done. ,827
	M1 9	The habitats of living things must be protected. ,761
	M1 7	Paper produced from trees should not be used unnecessarily. ,759
	M1 3	We should not damage historical artifacts. ,745
	M1 4	Water is one of the exhaustible energy sources. ,688
	M9	Living things in nature benefit the environment. ,552
	M1 8	Electricity is one of the exhaustible energy sources. ,529
	M1 5	Natural energy sources such as the sun and wind should be used. ,517
	NR	M6
M7		Animals interest me. ,72 3
M3		Plants are indispensable parts of natural life. ,59 8
M8		Burning forests makes me sad. ,56 3
A	M1 1	All living things feed on the same things. ,90 1
	M1 0	All living things are alike. ,83 8
	M1 2	Living things are inexhaustible (not extinct). ,83 7
HI	M2 1	I know what historical artifacts are. ,81 6
	M2 0	I know where historical monuments are protected. ,77 8
	M1	I travel to places such as forests and natural and historical areas. ,54 4
H	M2	Growing plants (flowers, trees, etc.) is fun. ,65 2
	M4	Flowers can be grown at home. ,62 4
	M5	I wonder how the vegetables and fruits I eat are grown. ,51 5

Cronbach's Alpha coefficients were found as 0.84 for the first subdimension, 0.76 for the second subdimension, 0.86 for the third subdimension, 0.68 for the fourth subdimension, and 0.60 for the fifth subdimension.

Kolmogorov–Smirnov, and Shapiro-Wilk tests were used to test whether the data showed normal distribution, and these analyzes revealed that the data were normally distributed. For this reason, independent samples t-test was conducted to compare the means of two independent groups. One-Way ANOVA was conducted to compare the means of more than two independent groups. If there was a difference between the groups as a result of the analysis of variance, the Scheffe test, one of the post hoc tests, was used to decide which groups had a significant difference.

3. Results

3.1. Gender

Table 3 shows no significant difference between the gender groups in scale scores except in the nature responsibility sub-dimension. The mean NS scores of the female group were higher than those of the male group, and this difference was statistically significant ($t_{(258)}=2504$; $p < 0.05$).

Table 3: The independent samples t-test results of ESEAS scores by gender

Subdimensions	Female	Male	t	P Value	H ₀ accept/reject
Ecocentric (E)	4,65	4,61	.092	.927	Accept
Nature Responsibility (NR)	4,66	4,53	2,504	.013*	Reject
Anthropocentric (A)	2,15	2,22	-.717	.474	Accept
Environmental Knowledge (EK)	4,13	4,02	.830	.407	Accept
Hedonistic (H)	4,48	4,31	1,095	.274	Accept
Total scores of ESEAS	7,30	7,16	1,768	.078	Accept

3.2. Grade

As seen from the ANOVA analysis results in Table 4, there was no significant difference between the grade-level groups in scale scores except in the hedonic dimension ($F_{(257)}=3,247$; $p < .05$). The result of Scheffe analysis showed that there was a significant difference between the 2nd and 4th-grade groups. The mean of hedonic dimension scores of the 2nd-grade group ($\bar{x}=4.575$) was higher than the mean of the 4th-grade level group ($\bar{x}=4.355$). In terms of the variable of grade level, H₀ hypothesis was accepted except for the hedonistic sub-dimension of the scale.

Table 4: The results of the one-way analysis of variance (ANOVA) of the ESEAS scores by grade level

Subdimensions	Groups	n	\bar{x}	ss	sd	F	p	H ₀ accept/reject
Ecocentric (E)	2nd grade	40	4.681	.9645	2	.029	.972	Accept
	3rd grade	98	4.606	.9857	257			
	4th grade	122	4.632	1.0301				
Nature Responsibility (NR)	2nd grade	40	4.637	.85626	2	.044	.957	Accept
	3rd grade	98	4.561	1.0870	257			
	4th grade	122	4.625	.97784				
Anthropocentric (A)	2nd grade	40	2.358	1.10159	2	.500	.607	Accept
	3rd grade	98	2.184	.99637	257			
	4th grade	122	2.120	.97222				
Environmental Knowledge (EK)	2nd grade	40	4.125	1.03911	2	2.565	.079	Accept
	3rd grade	98	3.939	1.059903	257			
	4th grade	122	4.178	.921956				
Hedonistic (H)	2nd grade	40	4.575	.9289489	2	3.247	.040	Reject 2nd grade / 4th grade
	3rd grade	98	4.381	.9045223	257			
	4th grade	122	4.355	1.074114				
Total scores of ESEAS	2nd grade	40	7.381	12.49205	2	1.512	.222	Accept
	3rd grade	98	7.176	13.57166	257			
	4th grade	122	7.240	13.05673				

3.3. Household income

The total household income of the students who participated in the study was between 2000 and 10000 Turkish liras (TL). As seen from the ANOVA result in Table 5, there was no significant difference in ESEAS scores between the four household income groups. Analysis of variance results showed that H_0 hypothesis was accepted for all factors and total scores in the scale.

Table 5: The results of the one-way analysis of variance (ANOVA) of the ESEAS scores by household income (TL).

Subdimensions	Groups (TL)	n	\bar{x}	ss	sd	F	p	H_0 accept/reject
Ecocentric (E)	0-3000	85	4.557	1.091444	3	2.121	.098	Accept
	3001-6000	95	4.621	.9916472	256			
	6001-9000	47	4.670	.9828044				
	9001 +	33	4.784	.7023474				
Nature Responsibility (NR)	0-3000	85	4.585	.9674060	3	1.709	.166	Accept
	3001-6000	95	4.647	.8466087	256			
	6001-9000	47	4.468	1.420395				
	9001 +	33	4.712	.6874289				
Anthropocentric (A)	0-3000	85	2.118	.8634412	3	1.395	.245	Accept
	3001-6000	95	2.323	1.084828	256			
	6001-9000	47	1.943	.9794834				
	9001 +	33	2.273	1.081862				
Environmental Knowledge (EK)	0-3000	85	3.973	1.128697	3	.705	.550	Accept
	3001-6000	95	4.032	.9605459	256			
	6001-9000	47	4.199	.8999450				
	9001 +	33	4.323	.8993213				
Hedonistic (H)	0-3000	85	4.443	1.095519	3	.352	.788	Accept
	3001-6000	95	4.421	.9212850	256			
	6001-9000	47	4.284	1.016609				
	9001 +	33	4.384	.9649788				
Total scores of ESEAS	0-3000	85	7.157	12.72308	3	1.911	.128	Accept
	3001-6000	95	7.269	13.17954	256			
	6001-9000	47	7.176	13.36626				
	9001 +	33	7.444	13.66260				

3.4. Mother's graduation

Table 6 shows no statistically significant difference between the scale's sub-dimensions and the total scores regarding the mother's graduation. According to this result, the H_0 hypothesis was accepted for all sub-dimensions and total ESEAS scores.

Table 6: The results of the one-way analysis of variance (ANOVA) of the ESEAS scores by mother's graduation

Subdimensions	Groups	n	\bar{x}	ss	sd	F	p	H_0 accept/reject
Ecocentric (E)	Out of school	6	4.333	1.2486	4	1.794	.130	Accept
	Primary school	52	4.507	.90469	255			
	Junior high school	41	4.664	.89106				
	Senior high school	82	4.630	1.1085				
	University	79	4.715	.95456				
	Out of school	6	4.667	.23156	4	1.035	.390	Accept

Nature Responsibility (NR)	Primary school	52	4.534	.92103	255			
	Junior high school	41	4.701	.82810				
	Senior high school	82	4.598	1.1770				
	University	79	4.598	.95861				
Anthropocentric (A)	Out of school	6	2.222	.87722	4			
	Primary school	52	2.289	.94606	255			
	Junior high school	41	2.358	1.1101		.687	.602	Accept
	Senior high school	82	2.081	.89379				
	University	79	2.118	1.0903				
Environmental Knowledge (EK)	Out of school	6	3.611	2.0165	4			
	Primary school	52	3.853	1.1173	255			
	Junior high school	41	4.106	.98307		1.849	.120	Accept
	Senior high school	82	4.102	.94039				
	University	79	4.228	.85784				
Hedonistic (H)	Out of school	6	4.056	1.2039	4			
	Primary school	52	4.333	.90097	255			
	Junior high school	41	4.585	1.1461		.505	.732	Accept
	Senior high school	82	4.398	1.0364				
	University	79	4.371	.93899				
Total scores of ESEAS	Out of school	6	6.952	14.791	4			
	Primary school	52	7.098	13.657	255			
	Junior high school	41	7.364	12.032		1.878	.115	Accept
	Senior high school	82	7.221	13.292				
	University	79	7.315	12.961				

3.5. Father's graduation.

As seen in Table 7, while ecocentric, there were no significant differences between the father's graduation groups for human-centered and hedonistic sub-dimension scores. However, there was a significant difference between the father's graduation groups for nature responsibility and environmental knowledge sub-dimension and total scores. According to Post Hoc analysis results, the significant difference in the nature responsibility sub-dimension was between secondary education and high school and university groups. The significant difference in environmental knowledge sub-dimension and total scores was between the elementary and university education groups. Therefore, H_0 hypothesis was rejected for these sub-dimensions of the scale.

Table 7: The results of the one-way analysis of variance (ANOVA) of the ESEAS scores by father's graduation

Subdimensions	Groups	n	\bar{x}	ss	sd	F	p	H_0 accept/reject
Ecocentric (E)	Primary school	47	4.476	1.0834	3			
	Junior high school	40	4.688	.87298	256	1.912	.128	Accept
	Senior high school	78	4.617	1.0708				
	University	95	4.692	.93001				
Nature Responsibility (NR)	Primary school	47	4.559	.921116	3			
	Junior high school	40	4.788	.656765	256	2.539	.05	Reject*
	Senior high school	78	4.529	1.21566				
	University	95	4.608	.933266				
Anthropocentric (A)	Primary school	47	2.206	.84802	3			
	Junior high school	40	2.325	.86182	256	.896	.444	Accept
	Senior high school	78	1.996	.92341				
	University	95	2.260	1.16967				
	Primary school	47	3.801	1.0875	3	4.087	.007	Reject**
	Junior high school	40	3.925	1.3331	256			

Environmental Knowledge (EK)	Senior high school	78	4.133	.85775				
	University	95	4.237	.84289				
Hedonistic (H)	Primary school	47	4.362	.98974	3	1.994	.115	Accept
	Junior high school	40	4.600	.91573	256			
	Senior high school	78	4.321	1.0557				
	University	95	4.397	.97575				
Total scores of ESEAS	Primary school	47	7.065	12.371	3	3.256	.022	Reject ***
	Junior high school	40	7.385	11.990	256			
	Senior high school	78	7.149	13.811				
	University	95	7.334	13.091				

3.6. How are the students' environmental awareness levels according to ESEAS scores

The ESEAS is a five-point Likert-type scale, scored as "5=completely agree", "4=agree", "3=neutral", "2=disagree", "1=totally disagree". Considering the formula developed by Tekin (2002), the reference ranges of the average scores are "1.00-1.80= Strongly disagree, 1.81-2.60=Disagree, 2.61-3.40=Undecided, 3.41-4.20=Agree, 4.21-5.00=Strongly agree". A mean score between 1.00 and 2.60 indicates that the participant's level of agreement with the statements in the relevant dimension is low. In contrast, an average score of 3.41 and above indicates that the participants' level of agreement with the statements in the relevant dimension is high.

Table 8: Environmental awareness levels according to sub-dimensions

Levels/ Subdimensions	\bar{X}	sd
Ecocentric	4.6298	.43728
Nature Responsibility	4.6029	.46937
Anthropocentric	2.1808	1.14060
Environmental Knowledge	4.0795	.77199
Hedonistic	4.3987	.56987

Analysis results in Table 8 show that the participants agreed with the expressions in ecocentric (\bar{X} =4.6298), nature responsibility (\bar{X} =4.6029), environmental knowledge (\bar{X} =4.0795), and hedonistic (\bar{X} =4.3987) sub-dimensions at a high rate. At the same time, they totally disagreed with the expressions in the anthropocentric (\bar{X} =2.1808) sub-dimension.

4. Conclusion, discussion, and recommendations

This study focused on the environmental awareness of elementary school students and showed that the null hypothesis was accepted in most scores related to scale factors. These results showed that the students who participated in the study tended to have information about the environment and the factors that threatened the environment, to be sensitive to nature, and to be ready to sacrifice to solve environmental problems.

There wasn't a significant difference between the scores of male and female students except for the sub-dimension of nature responsibility. This result was consistent with some studies that focused on the environmental awareness of primary school students and used the original ESEAS as a data collection tool. Erdem, Meriç ve Meriç (2019) reported a significant difference in favor of female students in the life in nature sub-dimension. Vatansever Bayraktar and Fırat (2020), Gökçe, Kaya, Aktay, and Özden (2007) determined a significant difference in favor of females according to the gender variable in primary school students' environmental awareness of the sub-dimension of living in nature. However, previous studies have reported different results regarding the effect of gender on environmental awareness. For example, in the studies conducted by Sharmin (2003) with primary school students and Shobeiri, Omidvar, and Prahallada (2007) with secondary school students, they found no difference between genders in students' environmental awareness levels. Çakar, Güneş, and Erdoğan (2013) also determined that environmental awareness levels of female students were higher than male students, but there was no significant difference between the groups.

There was a significant difference between the grade level groups in the hedonic dimension. The 2nd-grade students' participation in the statements in this dimension was higher than the 4th-grade students. In some studies conducted with elementary education students, it was reported that grade level could be a significant variable. Yıldız Yılmaz (2019) and Çakar, Güneş and Erdoğan (2013) stated that lower-grade students have higher environmental awareness than upper-grade students. Çelikler, Aksan and Yenikalaycı (2019) also determined that primary school students were highly aware of the environment. Kiraz and Fırat (2016) also reported in their studies that the level of environmental awareness differs between education levels. Researchers stated that students in lower education levels were more emotional about ecological issues, but environmental awareness increased towards higher levels. On the other hand, Szeberényi, Rokicki, and Papp-Váry (2022) found that teaching levels did not cause a difference in students' environmental awareness levels.

It was determined that there was no significant difference in environmental awareness among household income groups. Studies conducted by Fisman (2005) and Çavuşoğlu (2019) also reached similar results. This result may be associated with the fact that the socioeconomic levels of the sample were close, as stated in Çavuşoğlu's (2019) study. The household income of the study sample was low and moderate for Türkiye. Fisman (2005) attributed the lack of significant difference in household income to the fact that children living in low-income environments did not have the opportunity to explore their environment and relate to nature due to some concerns such as security and personal fears.

The research findings showed no significant difference between the maternal education level groups. On the other hand, there were significant differences between the father education level groups for the scores in some sub-dimensions (nature responsibility, environmental knowledge) and total scores. This result was consistent with the conclusions of some studies (Erdem, Meriç, & Meriç, 2019; Özcan, 2016, Verep & Vural, 2022). Vatansever Bayraktar and Fırat (2020) determined that there was no difference between environmental awareness and mother education level groups of primary school students, while there was a significant difference according to the father's education level. In the studies carried out by Kazazoğlu (2020) with university students and Gökçe et al. (2007) with secondary school students, it was determined that the educational status of the parents did not make a difference in the environmental awareness levels of the students. Conversely, Wihardjo, Hartati, Nurani, and Sujarwanta (2017) found that parents' education levels and family support had a significant effect on students' environmental awareness levels.

ESEAS total scores explained that students had positive attitudes toward the environment. This result may be related to the positive effect of the ties they establish with the environment and the knowledge they acquire in children's early family, social and academic lives. Studies on environmental education literature showed the importance of providing environmental education to gain concrete experience in developing environmental attitudes and awareness in students, that is, establishing direct interaction with the environment (Kurt Gökçeli et al., 2021). Various books on environmental education can be alternative materials to meet the educational needs of children to increase their awareness of the environment (Nurlaili & Priscylio, 2020).

Strengthening the commitment of children to nature, who have to stay away from the environment directly or indirectly due to technological developments and urbanization, and increasing their environmental awareness and consciousness should be the primary goals of today's education programmers and teachers. In an experimental study by Muldoon, Shelford, Holland, and Hryciw (2019) on children between the ages of 9 and 12, it was reported that there was a positive development in the awareness of children participating in environmental education and the difference between gender groups was significant. Similar results were obtained in another study, and it was determined that the environmental attitudes of children who participated in a five-day-long environmental education program developed positively (Mehra & Kaur, 2010). In this context, it is essential to revise the subjects on environmental education given at the theoretical level in the current curriculum so that children can interact with nature and establish a direct connection with it. In addition, it will be appropriate behavior for the basic components of the education world, such as students, teachers, parents, and administrative management, to be able to provide all kinds of academic and social opportunities for students/children to establish a relationship with nature and to carry out activities in this direction. Likely, students' developing positive awareness of the environment in which they were born and lived at the beginning of their education will positively reflect on their academic and social lives. Students with environmental awareness will have the skills to be aware of the changes

occurring in their environment, the adverse environmental conditions or problems they encounter in the early period, and to produce different solutions. For this reason, education for the environment will play an essential role in the continuation of this positive attitude towards the environment, which is present in the early ages of the students.

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