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Environmental Sensitivity of Teacher Education Students in the Earthquake Zone

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ABSTRACT

The research aimed to assess the environmental sensitivity of teacher education students within an earthquake-prone region, specifically exploring potential correlations between their environmental awareness, settlement size, educational program, and experiences related to the February 6 Earthquake. 342 students from Hatay Mustafa Kemal University Faculty of Education participated in the study, employing quantitative research methods and the "Environmental Sensitivity Questionnaire". Data analysis involved frequency, arithmetic mean, and percentages, with the Kruskal-Wallis H test used to examine the link between students' environmental sensitivity, program of study, and settlement size, and the Mann-Whitney U test employed to assess the association between experiencing the February 6 Earthquake and environmental sensitivity. The data were analyzed using the SPSS program. The findings revealed that teacher-education students exhibited partial environmental sensitivity. Notably, students enrolled in mathematics teaching programs displayed higher environmental sensitivity than those in social studies teaching programs, while students residing in metropolitan and urban areas exhibited greater environmental awareness than their counterparts in non-metropolitan areas. Moreover, the research highlighted that teacher education students in earthquake-prone regions exhibited partial sensitivity towards air and water pollution, with lower sensitivity regarding soil pollution, population planning, and engagement in environmental initiatives.

INTRODUCTION

The intricate interplay between the natural and social environments is widely acknowledged, where safeguarding the natural environment is pivotal for healthy living while fostering a sustainable and equitable social environment also shapes human responsibility toward the natural world (Akyuz, 2020; Bernhardt et al., 2020; Chawla, 2020; Eryılmaz, 2019; Li et al., 2021; Marseille et al., 2019). Notably, challenges associated with the natural environment, including global warming, climate change, and environmental pollution, often stem from human activities and the social environment, underscoring the collective responsibility to preserve and sustain the natural environment. This intricate relationship extends to climate change, environmental sensitivity, and disasters, where climate change exacerbates the frequency and intensity of natural disasters, impacting ecosystems and necessitating environmental stewardship. rising temperatures, rising sea levels, and glacial melting contribute to biodiversity loss, habitat alterations, and dwindling water resources, increasing ecosystem vulnerability to natural disasters. Consequently, natural disasters such as forest fires, soil erosion, and water pollution negatively affect environmental quality, further straining ecosystems and biodiversity, potentially disrupting the environmental equilibrium and exacerbating climate change (Akay, 2019; Bilben, 2018; Hiwasaki et al., 2014; Kurban, 2023; Turker, 2021; Uysal, 2022; Williams et al., 2017).

Disasters, often of natural origin, become catastrophic due to human actions and practices, a concept encapsulated in the adage, "It is not the earthquake but the building or negligence that

kills", highlighting the pivotal role of human behavior. Hence, prudent practices such as constructing houses away from flood-prone areas and ensuring earthquake-resistant infrastructure are crucial in mitigating the impact of natural events, emphasizing the importance of environmental consciousness and eco-friendliness. Individuals with such awareness are less vulnerable to floods and earthquakes, and teachers, education, and educational programs emerge as instrumental in cultivating this environmental sensibility (Bulu, 2023; Clerveaux et al., 2010; Degirmenci & Ilter, 2013; Kioupi & Arianoutsou, 2016; Ramadhan et al., 2019).

In the studies conducted by Cabuk and Karacaoglu (2003), Degirmenci et al. (2023), Demir and Yalcın (2014), Erdem et al. (2019), Gıcır et al. (2020), Kurt Konakoglu (2020), Okada et al. (2019), Pihkala (2020), Sogukpınar and Karısan (2020), Yesil and Turan (2020), Yesilyurt et al. According to the conclusions drawn from the studies, environmental sensitivity includes skills such as paying attention to issues such as sustainability and renewability and protecting natural resources. Sustainable environmental sensitivity through education can be seen as a key to reducing vulnerability to natural disasters and, thus climate change. Muttarak and Lutz (2014) emphasize that more educated individuals and societies are more prepared and respond quickly to disasters, are less exposed to negative impacts, and recover faster. Based on this emphasis, considering the role of teachers and teacher education students in educating society, it is particularly important. Examining the environmental sensitivities of teacher education students who experienced the earthquake and were affected by the disaster will perhaps bring different suggestions to the relationship between disaster, environmental sensitivity, and climate change.

The imperative of equipping teacher education students with knowledge and skills related to environmental protection, sustainability, and disaster preparedness cannot be overstated, as it forms the cornerstone for fostering environmentally conscious and disaster-resilient future generations. This significance has led to a plethora of studies exploring the environmental sensitivity and awareness of teachers and teacher education students (Brandt et al., 2019; Cengiz, 2022; Cavusoglu, 2019; Celik & Dogru, 2019; Deveci & Karteri, 2022; Duru, 2022; Kahyaoglu & Ozgen, 2012; Karadag & Acar, 2020; Kim et al., 2018; Ozonur, 2021; Oztarakcı, 2019; Patonah et al., 2018). These research outcomes can unveil the strengths and areas requiring improvement in environmental sensitivity among teacher education students, thus serving as a foundation for developing educational materials and programs tailored to enhancing environmental consciousness. Analyzing environmental sensitivities across various variables can shed light on the factors contributing to disparities in environmental awareness. For instance, Sahin et al. (2016) found that differences in environmental sensitivity and consciousness may manifest between students at the outset and conclusion of teacher training, signifying the transformative potential of teacher education in this regard.

The study conducted by Cabuk and Karacaoglu (2003) revealed higher environmental sensitivity among fourth-grade teacher education students. Investigating differences based on factors such as gender, grade level, and program of study can offer insights into environmental education within teacher training. Notably, within the context of the interplay between disasters and environmental education, research with teacher education students in Hatay province, profoundly affected by the February 6, 2023 earthquake, stands to make distinctive contributions to the field. This earthquake, which resulted in significant loss of life and injury, underscores the relevance of examining the environmental sensitivities of teacher education students in Hatay, offering a vital research avenue. Analyzing the environmental awareness of teacher education students residing in earthquake-prone regions like Hatay Province (Ozer, 2019; Ozdogan, 1993; Perk & Ozer, 2019) can raise earthquake preparedness awareness. Such heightened environmental sensitivity may empower teacher education students to incorporate earthquake awareness and disaster management into their future teaching careers, serving as role models for broader society. Given the profound societal impact of the teaching profession, environmentally conscious teachers have the potential to catalyze greater environmental awareness within society, possibly spearheading initiatives for environmental sustainability.

Investigating the environmental sensitivity of teacher education students in an earthquake-prone region like Hatay province can be deemed vital in elevating earthquake awareness, crafting educational materials, fostering social consciousness and engagement, and bolstering disaster preparedness. A more sustainable and resilient society can emerge when future educators act with environmental consciousness and disaster awareness. Exploring the environmental sensitivity of teacher education students holds the promise of advancing sustainability goals by enabling them to act as conscientious stewards of the environment. Moreover, past studies have uncovered disparities between teacher education students' knowledge levels regarding environmental issues and their actual environmental sensitivities (Brandt et al., 2019; Cengiz, 2022; Cabuk & Karacaoglu, 2003; Cavusoglu, 2019; Celik & Dogru, 2019; Duru, 2022).

In this investigation, we sought to examine the environmental sensitivity of teacher education students in Hatay, a region profoundly impacted by a recent earthquake disaster. Uncovering their environmental sensitivity signifies a critical step in identifying areas for improvement and addressing the deficiencies in their environmental consciousness. Therefore, we aimed to ascertain how much attention teacher education students in Hatay, who experienced the February 6 Earthquake in its most severe form, devote to environmental issues, their perspectives on environmental challenges and pollution, their beliefs regarding environmental education, and whether these factors vary across different variables, representing a research problem of significant relevance. This research aims to assess the environmental sensitivities of students enrolled in Hatay Mustafa Kemal University's Faculty of Education, situated in an earthquake-prone region.

The research objectives are as follows: (1) Assess the overall environmental sensitivity of teacher training students; (2) Evaluate the environmental sensitivity of teacher training students regarding: Air pollution, Water pollution, Soil pollution, Ecological balance, Participation in environmental studies, Perspectives on environmental education; (3) Investigate the correlation between the environmental sensitivities of teacher education students and factors such as residential size, educational program, and personal experience with the February 6 Earthquake. By accomplishing these objectives, the study aims to provide a comprehensive understanding of the environmental sensitivities of teacher education students in a region prone to earthquakes.

MATERIALS AND METHODS

Quantitative research methods were used in the study. The research is descriptive as it reveals the current situation and examines the differences between different variables. The study was conducted with Hatay Mustafa Kemal University Faculty of Education students in an earthquake-prone region. Of 2,024 students, 342 voluntarily completed the Environmental Sensitivity Questionnaire, forming the research study group.

The Environmental Sensitivity Questionnaire developed by Cabuk and Karacaoglu (2003) was used in the study. The questionnaire consists of 24 questions. Expert opinion was taken for the content and face validity of the questionnaire, a preliminary application was made in a group of 64 people, and the reliability level was determined. The scale's alpha reliability coefficient (α) was found to be 0.81. A factor analysis test was used for the construct validity of the sub-factors, and as a result of the factor analysis, it was determined by the questionnaire owners that all of the 24 items determined for the trial form were appropriate. The questionnaire consists of a three-grade structure consisting of “Always”, “Sometimes”, and “Never” options.

In the study, while the sample consisted of 342 teacher education students, it was observed that the data did not exhibit a normal distribution within the specified limits. The results of the environmental sensitivity questionnaire, assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests, indicated that the scores for the science teaching program were non-parametric ($p < .05$). In contrast, the scores for the social studies, classroom teaching, special education, and mathematics teaching programs were parametric ($p > .05$). Consequently, non-parametric tests were chosen for data analysis.

Table 1. Normality Test Results of Environmental Sensitivity Questionnaire According to the Program of Study

Test	Program Received Education	df	Statistic	p
Environmental Sensitivity Questionnaire	Social Studies Teacher Education	121	,078	,069
	Science Teacher Education	105	,148	,000
	Classroom Teaching	52	,102	,200*
	Special Education	44	,982	,718
	Mathematics Teacher Education	20	,963	,604

Source: Authors' Survey

According to the results of the environmental sensitivity questionnaire scores (Kolmogorov-Smirnov Test) obtained from the groups according to the size of the settlement, it was determined that metropolitan and city scores were nonparametric ($p<.05$). In contrast, metropolitan scores were parametric ($p>.05$). Therefore, it was decided to use non-parametric tests to analyze the data.

Table 2. Normality Test Results of the Environmental Sensitivity Questionnaire According to the Size of the Settlement

Test	Size of Settlement	df	Statistic	p
Environmental Sensitivity Questionnaire	Metropolitan (1,000,000-10,000,000 people)	35	,102	,200*
	Large city (100,000-1,000,000 people)	233	,104	,000
	City (20,000-100,000 people)	74	,131	,003

Source: Authors' Survey

According to the results of environmental sensitivity questionnaire scores (Kolmogorov-Smirnov Test) obtained from the groups according to being in the earthquake zone during the earthquake, it was concluded that all data did not show normal distribution ($p<.05$). Therefore, it was decided to use non-parametric tests to analyze the data.

Table 3. Normality Test Results of the Environmental Sensitivity Questionnaire byExperiencing the Earthquake

Test	Experiencing the Earthquake	df	Statist.	p
Environmental Sensitivity Questionnaire	Yes	296	,095	,000
	No	46	,140	,025

Source: Authors' Survey

In the investigation of environmental sensitivity among teacher education students, data from a study group comprising 342 participants were analyzed using various statistical methods. Frequency, arithmetic mean, and percentages were employed for data interpretation. The study explored the relationship between students' environmental sensitivity, program of study, settlement size, and experience with the February 6 Earthquake. To facilitate this analysis, the Environmental Sensitivity Questionnaire was administered, with responses coded as 3 (always), 2 (sometimes), and 1 (never). Arithmetic means calculated from the data were categorized into three levels of environmental sensitivity: scores between 1.00 and 1.66 were considered indicative of low-level sensitivity, scores between 1.67 and 2.32 signified medium (partial) sensitivity and scores between 2.33 and 3 reflected a high level of environmental sensitivity. The SPSS 26 (Statistical Packet for Social Sciences 26) software was employed for data analysis within a computer environment, enabling a comprehensive examination of teacher education students'

environmental sensitivity in an earthquake-prone region.

RESULTS AND DISCUSSION

Findings

The data were assessed to address questions about the environmental sensitivities of teacher education students, specifically focusing on air pollution, water pollution, soil pollution, ecological balance, participation in environmental studies, and their perspectives on environmental education. These results are presented and discussed in the subsequent tables within this study.

Table 4. Environmental Sensitivities of Teacher Education Students Regarding Air Pollution

Questions	Always		Sometimes		Never		$\bar{x}$
	N	%	n	%	n	%	
1. Are you careful not to use consumer goods (deodorants and other sprays) that contain substances harmful to the ozone layer?	59	17,3	216	63,2	67	19,6	1,98
2. Even if you own your own car, do you use public transportation, taking into account the need to avoid air pollution?	255	74,6	80	23,4	7	2,0	2,73
3. When you talk and use various tools, do you take care that other people are not affected?	138	40,4	179	52,3	25	7,3	2,33
4. Do you warn people to be sensitive about air pollution?	114	33,3	185	54,1	43	12,6	2,21
Total	N=342						2,31

Source: Authors' Survey

As seen in Table 4, the arithmetic mean of the answers given by teacher education students to the questions about air pollution was 2.31. It can be said that teacher education students are partially sensitive to the environment regarding air pollution.

Table 5. Environmental Sensitivities of Teacher Education Students Regarding Water Pollution

Questions	Always		Sometimes		Never		
	N	%	n	%	n	%	$\bar{x}$
5. Do you buy cleaning products with an eye on whether they contain harmful chemicals?	195	57	145	42,4	2	,6	2,56
6. Are you frugal in water use in all circumstances?	222	64,9	108	31,6	12	3,5	2,61
7. Do you take care to prevent harmful chemicals such as engine oil and paint from entering the sewage system?	184	53,8	149	43,6	9	2,6	2,51
8. Do you warn people to be sensitive about water pollution?	5	1,5	108	31,6	229	67,0	1,35
Total	N=342						2,26

Source: Authors' Survey

As seen in Table 5, the arithmetic mean of the answers given by teacher education students to the questions about water pollution was 2.26. It can be said that teacher education students are partially sensitive to the environment regarding water pollution.

Table 6. Environmental Sensitivities of Teacher Education Students Regarding Soil Pollution

Questions	Always		Sometimes		Never		
	n	%	n	%	n	%	$\bar{x}$
9. Do you take care to use both sides of the paper you write on?	7	2,0	135	39,5	200	58,5	1,44
10. Are you frugal in using paper napkins in all circumstances?	6	1,8	204	59,6	132	38,6	1,63
11. Do you plant seedlings taking into account the conditions suitable for their growth?	2	,6	85	24,9	255	74,6	1,26
12. Do you make sure that the waste reaches the garbage bin?	7	2,0	156	45,6	179	52,3	1,50
13. Do you dispose of waste in the appropriate recycling bins so that it can be recycled?	3	,9	217	63,5	122	35,7	1,65
14. Do you classify garbage when you throw it away?	2	,6	171	50,0	169	49,4	1,51
15. Do you warn people around you to be sensitive about soil pollution?	5	1,5	88	25,7	249	72,8	1,29
Total	N=342						1,47

Source: Authors' Survey

As seen in Table 6, the arithmetic mean of the answers given by teacher education students to the questions about soil pollution was 1.47. It can be said that the environmental sensitivity of teacher education students regarding soil pollution is low.

Table 7. Environmental Sensitivities of Teacher Education Students Regarding Ecological Balance

Questions	Always		Sometimes		Never		
	n	%	n	%	n	%	$\bar{x}$
16. If you were/are married, would you pay attention to population planning by considering ecological balance?	4	1,2	110	32,2	228	66,7	1,35
17. For the sake of humanity, do you approve of any kind of experimentation on humans and animals?	171	50,0	170	49,7	1	,3	2,50
18. Do you warn people around you to be sensitive about the protection of ecological balance?	3	,9	186	54,4	153	44,7	1,56
Total	N=342						1,80

Source: Authors' Survey

As seen in Table 7, the arithmetic mean of the answers given by teacher education students to the questions about ecological balance was 1.80. It can be said that teacher education students are partially sensitive to ecological balance.

Table 8. Teacher Education Students' Sensitivity to Participation in Environmental Studies

Questions	Always		Sometimes		Never		
	n	%	n	%	n	%	$\bar{x}$
19. Do you participate in scientific activities such as seminars, panels, and conferences on the environment?	0	0	170	49,7	172	50,3	1,50
20. Do you participate in the activities of voluntary organizations working on the environment?	0	0	173	50,6	169	49,4	1,51
Total	N=342						1,51

Source: Authors' Survey

As demonstrated in Table 8, the arithmetic mean of responses provided by teacher education students concerning their participation in environmental studies was 1.51, indicating a low level of sensitivity. Additionally, the arithmetic mean of their answers to the 20 questions regarding environmental sensitivity was 1.85, suggesting a medium level of environmental sensitivity and partial sensitivity among these students.

Table 9. Teacher Education Students' Views on Environmental Education

Questions	Yes		Partially		No		
	n	%	n	%	n	%	$\bar{x}$
21. Do you believe you have received enough training to raise awareness about air pollution?	0	0	165	48,2	177	51,8	1,48
22. Do you believe that you have received sufficient training to raise awareness about water pollution?	0	0	171	50,0	171	50,0	1,50
23. Do you believe that you have received sufficient training to raise awareness about soil pollution?	0	0	182	53,2	160	46,8	1,53
24. Do you believe that you have received enough education to raise awareness about ecological balance?	0	0	182	53,2	160	46,8	1,53
Total	N=342						1,51

Source: Authors' Survey

Table 9 illustrates that the arithmetic mean of teacher education students' opinions regarding the environmental education they received stands at 1.51. Notably, the arithmetic means for four items assessing student perceptions of environmental education are closely clustered around low values. These results are further supported by the percentages, indicating that the majority of students do not deem the environmental education they've received to be sufficient. It's noteworthy that none of the students consider their education to be comprehensive. Consequently, it can be inferred that teacher education students believe they have not received adequate instruction on subjects such as air pollution, water pollution, soil pollution, and ecological balance during their academic journey. This finding provides insight into these students' relatively limited environmental sensitivity. To assess whether there exists a significant disparity in environmental sensitivities based on the program of education, a Kruskal-Wallis H test, a nonparametric statistical test, was conducted, with the results presented in Table 10.

Table 10. Kruskal-Wallis H Test Analysis Results of Comparison of Environmental Sensitivity According to the Program of Education

Program Received Education	n	Mean Rank	df	X2	p	Significant Difference
Social Studies Teacher Education	121	161,08	4	10,911	,028	Mathematics S. > Social Studies S.
Science Teacher Education	105	173,27				
Classroom Teaching	52	170,15				
Special Education	44	166,78				
Mathematics Teacher Education	20	239,15				
Total	342					

Source: Authors' Survey

The analysis in Table 10 indicates a significant variance in the environmental sensitivity test scores among teacher education students based on their program of study (X^2 (4) = 10.911, p < .05). Further examination using the Mann-Whitney U test to pinpoint the specific groups driving this difference unveiled a significant contrast exclusively between students in the mathematics teaching and social studies teaching programs (Z = -3.269, p < .005). Specifically, mathematics teaching program students boasted a mean rank of 239.15. In contrast, their counterparts in the social studies teaching program had a mean rank of 161.08, indicating significantly higher environmental sensitivity scores among mathematics teaching program students. Interestingly, despite an environmental education course within the social studies program, this outcome was unexpected. Among teacher education students, those enrolled in the mathematics teacher education program exhibited greater environmental sensitivity, possibly suggesting that programs admitting students with higher entrance scores tend to foster heightened environmental sensitivity. To investigate whether significant differences exist in environmental sensitivities based on settlement size, a Kruskal-Wallis H test, a nonparametric test, was conducted, with results presented in Table 11.

Table 11. Kruskal-Wallis H Test Analysis Results for the Comparison of Environmental Sensitivity According to the Size of the Settlement

Size of Settlement	n	Mean Rank	df	X2	p	Significant Difference
Metropolitan (1,000,000-10,000,000 people)	35	97,57	2	21,996	,000	Big city>Metropolis, City>Metropolis
Large city (100,000-1,000,000 people)	233	180,80				
City (20,000-100,000 people)	74	177,18				
Total	342					

Source: Authors' Survey

Table 11 reveals notable disparities in the scores of teacher education students on the environmental sensitivity test based on the size of their settlement (X^2 (2) = 21.996, p < .05). Subsequent examination employing the Mann-Whitney U test to discern which specific groups contributed to these differences identified significant distinctions between students residing in metropolises and those in big cities (Z = -3.832, p < .016), as well as between students in cities and those in metropolises (Z = -4.688, p < .016). Specifically, teacher education students in metropolises exhibited a mean rank of 97.57, while those in big cities had a mean rank of 180.80, and students in cities held a mean rank of 177.18. This analysis found that environmental sensitivity scores were significantly higher among teacher education students residing in metropolitan and urban areas

compared to their counterparts in metropolitan areas. Consequently, this suggests that settlements prioritizing the preservation of their natural environment may positively influence the development of environmental sensitivity among their inhabitants. To ascertain whether significant differences existed in environmental sensitivities based on the experience of the February 6 Earthquake, a Mann-Whitney U test, a nonparametric test, was conducted, with results presented in Table 12.

Table 12. Mann-Whitney U Analysis Results of Environmental Sensitivity According to Experiencing the Earthquake

	N	Mean Rank	Sum of Ranks	Z	p
Yes	296	173,22	51273,50	-,819	,413
No	46	160,42	7379,50		
Total	342				

Source: Authors' Survey

Examination of Table 12 reveals the absence of a significant difference in environmental sensitivity scores based on the experience of the February 6 Earthquake ($p > .05$). Considering the rank averages, participants who experienced the earthquake had a mean rank of 173.22, while those who did not have a mean rank of 160.42. Consequently, it can be concluded that experiencing the earthquake disaster does not appear to significantly impact environmental sensitivity among the study participants.

Discussion

In light of the findings obtained by analyzing the data of teacher education students in the earthquake region, conclusions were reached, these results were discussed with different studies, and recommendations were made.

In the earthquake-prone region, the research revealed that teacher education students displayed a notable degree of environmental sensitivity, particularly concerning air pollution. Dimitriou and Christidou (2007) found that students have a concrete and generalized conceptualization of air pollution and air pollutants. They also emphasized that students were familiar with the anthropogenic sources of air pollution, the effects of air pollution on human health, and its interdependence with various environmental dimensions. In our research, a significant finding is the willingness of students to prefer public transportation even if they own a private car to reduce air pollution. However, it was also observed that these students did not consistently avoid consumer products, such as deodorants and sprays, containing ozone-depleting substances. This emphasis on air pollution aligns with prior research. Oguz et al. (2011) found that Turkish students in programs like landscape architecture, environmental engineering, and urban and regional planning considered air pollution the most pressing environmental issue. Additionally, Gill et al. (2018) emphasized the pivotal role of energy as a determinant of pollution on a global scale, advocating for government policies that promote renewable energy sources by taxing fossil fuels and incentivizing renewables. Given these insights, future research in Turkey must explore the interplay between energy pollution, renewable energy adoption, and environmental sensitivity, expanding the discourse beyond conventional concerns about air, water, and soil pollution.

The research findings indicated that teacher education students displayed varying environmental sensitivity, particularly regarding water and soil pollution. While they exhibited partial sensitivity regarding water pollution and showed some inclination towards conserving water, their willingness to raise awareness about water pollution, among others was notably low. This aligns with Pirincci et al.'s (2020) observations that health vocational school students in Turkey prioritize concerns about water consumption and pollution. Interestingly, Pirincci et al. also highlighted that the most significant environmental issue in Turkey, as perceived by students, was the decline in forests, followed by air pollution, lack of awareness, unplanned urbanization, and water pollution. This forest decline is closely linked to soil pollution, and indeed, the research here corroborated these findings by revealing teacher education students' relatively low environmental sensitivity concerning soil pollution. Despite a somewhat higher sensitivity towards proper waste

disposal for recycling purposes, their readiness to plant saplings under suitable conditions was similarly limited. This outcome mirrors the results from Cabuk and Karacaoglu's (2003) earlier study, conducted using the same questionnaire, emphasizing that students sporadically engage in sapling planting activities when favorable conditions are present.

The study revealed that teacher education students showed varying levels of environmental sensitivity, especially regarding the importance they attach to ecological balance and ethical concerns regarding experiments on humans and animals. Similarly, Millett and Lock (1992) found that women were more strongly opposed to animal use than men and that students' beliefs differed according to animal use. However, the students' sensitivity in our study towards population planning was relatively low, possibly due to changes in Turkey's population policies. Historically, Turkey had pursued anti-natalist policies to reduce population growth until the 2010s. However, there has since been a transition towards pro-natalist and fertility-promoting policies, reflecting changes in the country's demographic landscape (Kucuk, 2020). This shift aligns with the findings from two decades ago, when a similar questionnaire was employed, reaffirming the impact of population planning policies on students' attitudes. Despite the policy shift, many teacher education students expressed an ongoing commitment to considering ecological balance and maintaining sensitivity towards population planning, suggesting that ecological concerns continue to resonate with them (Cabuk & Karacaoglu, 2003).

The research identified a low level of environmental sensitivity among teacher education students about their participation in environmental studies, as they demonstrated limited engagement in voluntary organizations focused on environmental issues and scientific events like seminars, panels, and conferences on environmental topics. This finding is consistent with previous observations, such as those made by Cabuk and Karacaoglu (2003), who noted occasional participation of teacher education students in such events. Similarly, Pirincci et al. (2020) found that more than half of health vocational school students had not previously participated in environmental-focused scientific studies or events.

The analysis of environmental sensitivity based on the student's program of study unveiled a significant difference, with students in the mathematics teaching program demonstrating higher levels of environmental sensitivity compared to those in the social studies teaching program. This aligns with Pirincci et al.'s (2020) findings, suggesting that programs with higher university entrance requirements tend to yield greater environmental sensitivity. However, no significant differences were observed among students in other programs. This outcome contrasts with research by Kayalı (2013), who identified a significant difference favoring social studies teaching students over those in the classroom and Turkish language teaching programs, indicating higher environmental sensitivity. Interestingly, the questionnaire used in this study, developed by Cabuk and Karacaoglu in 2003, had previously revealed significant differences among students from various programs, with students in public education, curriculum and instruction, preschool teaching, and classroom teaching programs exhibiting higher environmental sensitivity. Given the regional variations in these studies, future research could investigate environmental sensitivity among teacher education students in different regions. In line with this suggestion, the study found that students residing in metropolitan and urban areas displayed greater environmental sensitivity than those in metropolitan regions, suggesting that settlements fostering natural environmental preservation positively influence environmental sensitivity, while the experience of an earthquake disaster did not significantly impact environmental sensitivity. This finding contrasts with the notion that environmental perceptions directly affect disaster risk (Ao et al., 2020). However, it aligns with Demir and Yalcın's (2014) discovery that environmental education involving nature-based field studies fosters the transformation of knowledge into environmentally conscious behavior and positive attitudes towards the environment.

The research findings indicated that teacher education students in earthquake-prone regions exhibited partial environmental sensitivity. A comparison with Ozturk's (2019) study, which revealed low sensitivity scores among students in various associate degree programs, suggests that the education received in teacher training programs

may positively influence environmental sensitivity. However, the study highlighted that students perceived a deficiency in their education regarding air, water, soil pollution, and ecological balance, reflecting an unsurprising outcome that inadequate environmental education can hinder the development of high environmental sensitivity. This result aligns with Demir and Yalcın's (2014) assertion that a lack of nationally established and implemented environmental education policies for higher education in Turkey, coupled with the autonomy of universities in shaping their curricula, leads to a lack of standardized educational infrastructure for environmental issues in higher education. Contrarily, Oguz et al. (2010) emphasized the need for a national strategy for environmental education in higher education and a reevaluation of the current curriculum for effectiveness. The partial environmental sensitivity observed in teacher education students resonates with Pirincci et al.'s (2020) findings that university students generally exhibit a medium level of environmental sensitivity. Kayalı (2013) emphasized teacher education students' generally positive attitude towards environmental issues. Bhalla (2015) found that pre-service teachers have a notably high level of environmental sensitivity. Tekoz et al. (2010) discovered that teachers and teacher education students, despite limited subject knowledge, are enthusiastic about integrating environmental issues into their teaching practices. Hence, teachers and teacher education students hold great potential as recipients of environmental education, underscoring the importance of strengthening environmental education within teacher education curricula.

In summary, teacher education students in earthquake-prone regions demonstrated varying levels of environmental sensitivity, particularly regarding air pollution. However, the overall environmental sensitivity appeared to be partially developed, with deficiencies in pollution and ecological balance education. To enhance environmental awareness, teacher training programs must bolster their environmental education components. Future research should explore the dynamic relationship between energy pollution, renewable energy adoption, and environmental sensitivity, expanding beyond traditional concerns about pollution. Moreover, the study revealed regional disparities in environmental sensitivity, emphasizing the importance of regional-specific educational approaches to nurture environmental consciousness among teacher education students. Additionally, despite a shift in population planning policies, a commitment to ecological balance and sensitivity toward population planning persists among students, highlighting the enduring relevance of ecological concerns. Efforts should be made to integrate these concerns into environmental education curricula. Lastly, fostering greater participation in environmental studies and events among teacher education students is essential to cultivating a generation of educators who are more actively engaged in environmental issues.

CONCLUSION

Teacher education students in earthquake-prone regions exhibit partial environmental sensitivity, with a particular focus on air pollution. However, their environmental awareness is underdeveloped, especially concerning pollution and ecological balance. Teacher training programs should strengthen environmental education components to enhance their environmental consciousness. Future research should explore the relationship between energy pollution, renewable energy, and environmental sensitivity. Regional disparities highlight the need for tailored educational approaches and a lasting commitment to ecological balance calls for its integration into environmental education curricula. Promoting greater participation in environmental studies is essential to empower future educators who actively engage with environmental issues.

REFERENCES

Akay, A. (2019). The effects of disasters caused by climate change. *Climate Change Training Modules Series*, 15, 1-77.

Akyuz, E. (2020). *Unknown 100 scientific facts on environmental problems*. Astana Publications.

Ao, Y., Huang, K., Wang, Y., Wang, Q., & Martek, I. (2020). Influence of built environment and risk perception on seismic evacuation behavior: Evidence from rural areas affected by Wenchuan earthquake. *International journal of disaster risk reduction*, 46, 101504.

Bernhardt, J. R., O'Connor, M. I., Sunday, J. M., & Gonzalez, A. (2020). Life in fluctuating environments. *Philosophical Transactions of the Royal Society B*, 375(1814), 20190454.

Bhalla, V. (2015). Environment awareness among student teachers: a challenge. *International Research Journal of Management and Commerce*, 2(8),79-85.

Bilben, M. S. I. (2018). Migration debates in the context of anthropogenic climate change. *Journal of Social Policy Conferences*, (75), 237-268.

Brandt, J. O., Burgener, L., Barth, M., & Redman, A. (2019). Becoming a competent teacher in education for sustainable development: Learning outcomes and processes in teacher education. *International Journal of Sustainability in Higher Education*, 20(4), 630-65.

Bulu, D. (2023). *Determination of disaster awareness perception levels of classroom teachers* [Master's thesis], Bartın University Institute of Educational Sciences.

Cabuk, B. & Karacaogu O.C. (2003). Investigation of environmental sensitivities of university students. *Ankara University Journal of Faculty of Educational Sciences (JFES)*, 36(1), 189-198.

Cavusoglu, U. (2019). *Investigation of the relationship between teacher education students' environmental education self-efficacy and their attitudes towards sustainable environment* [Master's thesis]. KSI University

Celik, M. & Dogru, M. (2019). Investigation of science teacher education students' behaviors towards environmental problems. *Van Yuzuncu Yıl University Journal of Faculty of Education*, 16 (1), 1791-1813.

Cengiz, F. B. (2022). *Determination of environmental consciousness level of teacher education students* [Master's thesis], Hacettepe University.

Chawla, L. (2020). Childhood nature connection and constructive hope: a review of research on connecting with nature and coping with environmental loss. *People and Nature*, 2(3), 619-642.

Clerveaux, V., Spence, B., & Katada, T. (2010). Promoting disaster awareness in multicultural societies: the DAG approach. *Disaster Prevention and Management: An International Journal*, 19(2), 199-218.

Degirmenci, B., Durmaz, Y., Fidanoglu, A., & Degirmenci, S. (2023). Psychological effects of COVID-19 phobia on industrial consumers: a case study in Turkey. *Journal of Business & Industrial Marketing*, 38(1), 170-187.

Degirmenci, Y., & Ilter, I. (2013). Natural disasters in geography course curriculum, *Marmara Journal of Geography*, (28), 276-303.

Demir, E. & Yalcın, H. (2014). Environmental education in Turkey. *Turkish Journal of Scientific Review*, (2), 7-18.

Deveci, I., & Karteri, I. (2022). Context-based learning supported by environmental measurement devices in science teacher education: A mixed method research. *Journal of Biological Education*, *56*(5), 487-512.

Dimitriou, A., & Christidou, V. (2007). Pupils' understanding of air pollution. *Journal of Biological Education*, *42*(1), 24-29.

Duru, B. (2022). *Examination of the world views of education faculty students towards the new environmental paradigm and deep ecology* [Master's thesis], Aydın Adnan Menderes University.

Erdem, M., Meric, E. & Meric, A. (2019). Evaluation of primary school students' environmental sensitivity in terms of various variables. *Journal of STEAM Education*, 2(1), 21-38.

Eryılmaz, C. (2019). Society-environment interaction in Durkheim: Environmentalist potential against exclusionary social phenomena. *Istanbul University Journal of Sociology*, 39(1), 135-157.

Gıcır, B., Oruc, I. & Ozatlı, N.S. (2020). Examining the environmental behavior levels of generations X, Y, Z according to different variables: Balıkesir example. *Journal of Education and Society Research*, 7(2), 491-516.

Gill, A. R., Viswanathan, K. K., & Hassan, S. (2018). The Environmental Kuznets Curve (EKC) and the environmental problem of the day. *Renewable and Sustainable Energy Reviews*, 81, 1636-1642.

Hiwasaki, L., Luna, E., & Shaw, R. (2014). Process for integrating local and indigenous knowledge with science for hydro-meteorological disaster risk reduction and climate change adaptation in coastal and small island communities. *International journal of disaster risk reduction*, 10, 15-27.

Kahyaoglu, M. & Ozgen, N. (2012). Investigation of teacher education students' attitudes towards environmental problems in terms of various variables. *Journal of Theoretical Educational Science*, 173.

Karadag, Y. & Acar, F. (2020). Investigation of social studies teacher education students' awareness of environmental problems. *International Journal of New Approaches in Social Studies*, 4 (1), 62-78.

Kayalı, H. (2013). Social studies, Turkish and primary school teacher candidates' attitudes towards environmental problems. *Marmara Journal of Geography*, (21), 258-268.

Kim, H. T., Kim, J. G., & Kim, C. (2018). Emotional intimacy with nature and life & intellectual interest in life of pre-service biology teachers for environmental education. *Journal of Biological Education*, *52*(3), 236-247.

Kioupi, V., & Arianoutsou, M. (2016). Greek students research the effects of fire on the soil system through project-based learning. *Journal of Biological Education*, *50*(3), 304-319.

Kucuk, A. (2020). Beyond philanthropy: Rockefeller influence on population and agricultural policies in Turkey. *Ankara University SBF Journal*, 75 (4), 1491-1516.

Kurban, D. (2023). *Action plans of cities against climate change: EU and Turkish cities* [Master's thesis], Trakya University Institute of Social Sciences.

Kurt Konakoglu, S.S. (2020). A study to determine the level of awareness, consciousness and sensitivity of university students on environmental issues: Amasya university urban design and landscape architecture department example. *Mehmet Akif Ersoy University Journal of Institute of Science and Technology*, 11 (2), 130-141.

Li, L., Sun, W., Hu, W., & Sun, Y. (2021). Impact of natural and social environmental factors on building energy consumption: Based on bibliometrics. *Journal of Building Engineering*, 37, 102136.

Marselle, M.R., Stadler, J., Korn, H., Irvine, K.N., & Bonn, A. (2019). *Biodiversity and health in the face of climate change*. Springer Nature.

Millett, K., & Lock, R. (1992). GCSE students' attitudes towards animal use: some implications for biology/science teachers. *Journal of Biological Education*, *26*(3), 204-208.

Muttarak, R., & Lutz, W. (2014). Is education a key to reducing vulnerability to natural disasters and hence unavoidable climate change?. *Ecology and society*, 19(1).

Oguz, D., Cakci, I., & Kavas, S. (2010). Environmental sensitivity of university students in Ankara, Turkey. *African Journal of Agricultural Research*, 5(19), 2629-2636.

Oguz, D., Cakcı, I., & Kavas, S. (2011). Environmental sensitivity of students in higher education. *Journal of Suleyman Demirel University Faculty of Forestry*, 12(1), 34-39.

Okada, T., Tamaki, T., & Managi, S. (2019). Effect of environmental sensitivity on purchase intention and satisfaction pertaining to electric vehicles in Japan. *Transportation Research Part D: Transport and Environment*, 67, 503-513.

Ozdogan, S. (1993). Earthquake regions of Turkey. *Journal of Turkish Geography Research and Application Center*, 2, 53-68.

Ozer, C. (2019). Determination of 3-D crustal seismic velocity structure beneath Hatay and surroundings. *Journal of the Faculty of Engineering and Architecture of Gazi University*, 34(4), 2215-2227.

Ozonur, M. (2021). An investigation of prospective teachers' awareness toward environmental issues. *International Journal of Curriculum and Instruction*, 13(2), 1845-1856.

Oztarakcı, D. (2019). *Teacher education students' environmentally friendly behaviors and environmental identities* [Master's thesis]. Balıkesir University.

Ozturk, S. A. (2019). Examining the environmental sensitivity of associate degree students of

social sciences. *Journal of Innovative Research in Social Studies*, 2(1), 71-79.

Patonah, S., Rahardjo, S. B., Cari, C., & Sajidan, S. (2018). The potential of outing class activities to enhance environmental sensitivity for elementary school pre-services teacher. *International Journal of Pedagogy and Teacher Education*, 2, 1-1.

Perk, S. & Ozer, C. (2019). Investigation of soil properties under accelerometer stations using earthquake records: The case of Hatay, Turkey. *Turkish Journal of Earthquake Research*, 1(2), 167-179.

Pihkala, P. (2020). Eco-anxiety and environmental education. *Sustainability*, 12(23), 10149.

Pirincci, E., Atıcı, E., Oguzoncul, A. F., Deveci, S. E., Ozan, A. T., Sen, M. A., & Arca, M. (2020). Evaluation of a college students' sensitivity to the environment. *Van Medical Journal*, 27(4), 480-488.

Ramadhan, S., Sukma, E., & Indriyani, V. (2019). Environmental education and disaster mitigation through language learning. *IOP conference series: Earth and environmental science*, 314(1), 012054).

Sahin, S., Unlu, E. & Unlu, S. (2016). Investigation of environmental literacy awareness levels of teacher education students. *Education Sciences*, 11(2), 82-95.

Sogukpınar, R. & Karısan, D. (2020). Investigation of middle school students' attitudes towards the environment. *Mehmet Akif Ersoy University Journal of Faculty of Education*, (53), 583-606.

Teksoz, G., Sahin, E., & Ertepinar, H. (2010). A new vision for chemistry education students: environmental education. *International Journal of Environmental and Science Education*, 5(2), 131-149.

Turker, A. (2021). 2018 geography course curriculum and the concept of climate change in textbooks. *Social Science Development Journal*, 6(23).

Uysal, Y. (2022). The role of local governments in combating climate change and global warming: Determinations and Suggestions. *Kesit Academy Journal*, 8(30), 324-354.

Williams, S., McEwen, L. J., & Quinn, N. (2017). As the climate changes: Intergenerational action-based learning in relation to flood education. *The Journal of Environmental Education*, 48(3), 154-171.

YanarateŞ, E. and Yılmaz, A. (2020). Prospective Teachers' Metaphorical Perceptions of the Concept of "Environmental Sensitivity". *Gazi University Gazi Faculty of Education Journal*, 40(3), 1019-1050.

Yesil, M. & Turan, Y. (2020). A scale development study on environmental sensitivity. *Ordu University Institute of Social Sciences Journal of Social Sciences Research*, 10 (2), 418-435.

Yesilyurt, M., Balakoglu, M. O., & Erol, M. (2020). The impact of environmental education activities on primary school students' environmental sensitivity and visual expressions. *Qualitative Research in Education*, 9(2), 188-216.