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Determination of Environmental Ethics Approaches of Urban and Regional Planning Students

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Abstract

Urban planners who are environmentally conscious and aware will take action to take responsibility, inform, and control. Raising environmental awareness is essential in urban planning education to understand environmental problems. Therefore, it is necessary to educate urban planning students on environmental ethics.

This study investigates the environmental attitudes and behaviors of urban and regional planning students, who will shape the environment in the future within the context of the value-belief-norm theory. Moreover, to find clues that will shape environmental education in the course curriculum. The study included 226 students from the Department of Urban and Regional Planning in the Faculty of Architecture of Yıldız Technical University (YTU) and Amasya University (AU). Questionnaire data has been evaluated using principal components analysis, correlation analysis, T-test, and ANOVA analysis. According to the study findings, urban planning students have adopted biocentric, ecocentric, and anthropocentric value orientations. The study has found that students with ecocentric value orientation tend to show more pro-environmental behavior.

The study concludes that the student's characteristics also affect how they show pro-environmental behavior and evaluate environmental policies. In conclusion, focusing on ecocentric approaches in urban planning education can positively affect adopting pro-environmental behavior and policies. Additionally, study findings show that students with relatively better economic conditions are more inclined to have a biocentric value orientation. Based on the literature and these study findings, pro-environmental behavior is not a single-dimensional structure caused only by individuals' personal and professional characteristics. People's environmental attitudes and behaviors are shaped by their upbringing, school, friends, and culture. It shows that pro-environmental behavior has a multi-dimensional complex structure, and a conceptual framework can provide guidance to explain these kinds of behavior.

Keywords:
Environmental ethics, environmental policies, new ecological paradigm, pro-environmental behavior

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INTRODUCTION

Environmental ethics has emerged as a critical concern in contemporary urban and regional planning, as it plays a crucial role in shaping sustainable development and responsible decision-making. Understanding the approaches of individuals involved in this field toward environmental issues is essential for fostering a more sustainable future.

Several studies have delved into the intricacies of environmental ethics and its implications for various professional groups. Yücel (2005) conducted a significant analysis of environmental professionals, including academics and higher-level bureaucrats in Türkiye, focusing on their environmental knowledge, attitudes, and behaviors. Surprisingly, the study revealed a concerning disconnect between respondents' environmental knowledge and their actual behavior, despite possessing a moderate level of environmental knowledge. This finding underscores the necessity of investigating how education and awareness influence individuals' environmental ethics and actions.

Furthermore, Gökşen (2021) explored the awareness of environmental problems and environmental attitudes among environmental officers in Ankara-based environmental consultancy firms. The study revealed that participants faced challenges in effectively translating their environmental awareness into tangible behaviors. It also highlighted the influence of variables such as gender and length of service on environmental attitudes, suggesting that factors beyond mere awareness may shape individuals' ethical approaches.

Studies about pro-environmental behavior among university students within the last 20 years found that their education affects their environmental behavior (Talay et al., 2004; Ramirez, 2006; Oğuz et al., 2010; Smith-Sebasto, 1995). This study measures students' environmental ethics approaches and pro-environmental behavior in urban and regional planning departments. Urban and regional planning education aims to educate planners with experience in sustainable spatial development and social welfare, civil participation, and resolution of conflicts. Therefore, like any applied learning, urban planning education includes practical courses focused on problem-solving and theoretical infrastructure (Özkazanç & Korkmaz, 2019, p. 124). With the rising sustainability concerns, planning education has started to include ecological urban development topics such as protecting the natural environment and biodiversity and, more efficient renewable energy sources and more extensive use of recycling systems. Students learn about land use and concepts about people, environment, and economies. They have practical courses on policy and strategy-based planning for spatial development focused on balancing economic growth and development and environmental resources in planning activities in locations of various sizes (neighborhood, district, city, region) (Özcan, 2016, p. 9). In other words, students can experience the urban development process by observing and maintaining usage and protection balance in the urban development process and developing

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environmentally friendly policies/strategies. In addition to understanding environmental problems, raising environmental awareness is essential in urban planning education.

Urban planners who are environmentally conscious and aware will take action to take responsibility, inform, and control. Therefore, it is imperative to educate urban planning students on environmental ethics. This knowledge will encourage students to choose production alternatives with the minimum impact on the environment in the spatial plans they will make in their professional lives and have decision-makers accept these plans, which will result in better policies for the environment. This study firstly attempts to understand how effective education in urban planning schools encourages students to adopt an environmentalist or pro-environmental view. Secondly, this study investigates whether students with a pro-environmental view tend to show pro-environmental behavior. Thirdly this study focuses on whether environmental ethics approaches of urban planning students result in differences in their evaluation of environmental policies and strategies. Finally, based on these data, this study recommends developing environmental attitudes and behaviors with urban planning education. Based on the above-given information, the study intends to find the answers to the following questions:

• What components determine the environmental ethics approaches of urban planning students?

• Is there a relationship between the environmental ethics approaches of planning students and how they evaluate environmental policies and pro-environmental behavior? If yes, what is the strength and orientation of this relationship?

• Is there a relationship between the socio-demographic characteristics of planning students and how they perceive environmental policies and pro-environmental behavior? If yes, what is the strength and orientation of this relationship?

• If there is a significant difference between the urban planning students' mean scores for environmental ethics, pro-environmental behavior, and environment policies according to their characteristics, which groups differ from the others?

THEORETICAL BACKGROUND

Relationship between Environmental Ethics and Pro-Environmental Behavior

The "Common Future" report of the Brundtland Commission emphasizes the importance of ethics and morals in dealing with environmental problems (Bozdemir, 2019, p. 39). Environmental ethics, an essential field of practical ethics, is a discipline that studies the moral relationship of human beings to the value and moral status of the environment and its nonhuman contents (Brennan & Lo, 2002). In most general definitions, environmental ethics shapes the relationship between people and the natural environment with discourses about

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today and future generations (Çamur, 2020, p. 244). Understanding how people define their relationship with the outer world, in other words, whether they attach an instrumental value (which they achieve their end goals) to those around them or themselves, is essential to follow discussions about environmental problems. In this regard, it is possible to discuss three environmental ethics approaches: anthropocentric (human-centered), biocentric (life-centered), and ecocentric (nature-centered) (Çamur, 2020, p. 251).

Two important beliefs stand out in the anthropocentric approach. The first is the belief that "humans are the center of everything and the only goal of the universe". The second one is "Only the values of humans are what matters" (Çamur, 2020, p. 251). Therefore, people who advocate an anthropocentric ethical approach want to protect the environment because the environment is indispensable for the survival of humans and for improving the quality of life. According to people who advocate an anthropocentric ethical approach, natural resources should be consumed balanced so that we still have energy in the future and our quality of life is maintained. Similarly, pollution (air, soil, and water pollution) should be prevented because it constitutes a health threat to us. As seen above anthropocentric environmental ethics approach is an ethical approach that promotes the belief that all living and non-living things are meant to be used by people (Thompson & Barton, 1994, pp. 149-150; Erten, 2007, p. 69).

In the biocentric ethical approach, all life forms have intrinsic values (as a set of experiences that are good and our capacity to have them). With this approach, humans are a part of the natural environment and equal to all living beings. All living beings – humans, plants, or animals – have the same rights without being superior to others. Therefore, the biocentric ethical approach is based on the belief that all living beings except humans have ethical values (Thompson & Barton, 1994, pp. 149-150; Bozdemir, 2019, p. 42; Çamur, 2020, p. 251).

The ecocentric ethical approach promotes the opposite of what the anthropocentric ethical approach does. The main idea in the ecocentric ethical approach is that the ecosystem is the only source of life (Gray et al., 2018, p. 130). In other words, the ecocentric ethical approach considers humans and all living and non-living things as a whole in a system. This approach considers all beings worthy of ethical values due to their reason for being (Ergün & Çobanoğlu, 2012, p. 98). In other words, an ecocentric individual prioritizes environmental protection when using water and energy efficiently, recovering or recycling waste (Thompson & Barton, 1994, pp. 149-150; Erten, 2007, p. 69). The reason behind the nature-centered ethical approach is that human-centered and life-centered ethical approaches are insufficient to protect the environment (Birden, 2016, p. 11). While biocentric approaches value ecosystems because they will protect plants and animals, the ecocentric approach focuses more on the ecosystem than individual life forms. In short, while on the one hand, it allows protection of biological diversity,

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on the other hand, it also includes protection of geological diversity (Bozdemir, 2019, p. 43; Çamur, 2020, p. 254).

The literature shows that people's values positively affect them, which results in pro-environmental behavior (Stern, 2000, p. 408; Dunlap et al., 2000; Kollmuss & Agyeman, 2002; Cottrell, 2003). Therefore, understanding the effect of moral principles on pro-environmental behaviors provide essential clues to increase awareness of environmental responsibility.

Studies focusing on the factors that motivate people to show environmental behavior do this under two main categories: economic and ethical motivations. While economic approaches focus on the benefits and costs of pro-environmental behaviors, ethical approaches focus on other dimensions such as values, environmental concerns, moral responsibilities, and social norms (Karayeğen Balent, 2020, p. 148). Therefore, this study is focused on ethical approaches. Studies that investigate environmental concerns and moral norms focus on the relationship between socio-demographic characteristics of people and the likelihood that they will have a moral obligation to protect the environment (Dunlap et al., 2000; Kollmuss & Agyeman, 2002; Cottrell, 2003); on the effects of moral perspectives of individuals on their environmental behaviors; on the effect of environmental information on environmental awareness and behavior styles (Manoli et al., 2019, p. 4; Wong et al., 2018; Pan et al., 2018; Özdemir, 2012; Müderrisoğlu & Altanlar, 2011; Birand, 2016) and on how it affects citizenship and consumption patterns (Turaga et al., 2010). These studies show that people's values positively affect them, which results in pro-environmental behavior. These studies suggest that understanding the effect of moral values on pro-environmental behaviors will provide essential clues to increase awareness of environmental responsibility. Such information will reduce the environmental impact of production processes and create a society with high environmental awareness (Tekeli & Ataöv, 2017, p. 93). Therefore, the scope of this study focuses on identifying the relationship between morals and environmentalism, which motivates urban planning students' behaviors. The study's findings are believed to provide critical insight into the content and scope of urban planning education, which will help urban planning students adopt an ecocentric environmental ethics approach.

Theories that Determine Pro-Environmental Behavior

Pro-environmental behavior includes all kinds of intentions and behaviors that positively affect the resources, energy consumption, or biosphere structure and dynamics (Stern, 2000, p. 408). Some studies on this subject suggest that policies and goals that aim to consume more than nature can be prevented by increasing pro-environmental behavior that supports the idea that people need to consciously reduce their activities that have a negative impact on the natural environment (Kollmuss & Agyeman, 2002, p. 240). Because the increasing motivation for pro-

environmental behaviors is believed to help reduce the environmental impact of production processes and create a society with high environmental awareness (Tekeli & Ataöv, 2017, p. 93).

Stern (2000) classifies pro-environmental behaviors under four categories. These are; (1) environmental activism, such as participating in protests or signing petitions, (2) nonactivist behaviors in the public sphere, such as supporting pro-environmental government policies, (3) private-sphere environmentalism, such as green consumption, purchasing energy-efficient consumer goods, recycling domestic waste and (4) other environmentally significant behaviors which can be examined under the organizational environmentalism such as organizations implementing policies that encourage their employees to reduce energy use or waste production (Stern, 2000, pp. 409-411).

The literature on environmental psychology uses many models to understand and explain pro-environmental behavior. This study will shortly discuss some of the conceptual approaches such as the theory of planned behavior (Ajzen, 1985), norm activation model (Steg & De Groot, 2010), value-belief-norm model (Stern, 2000), and comprehensive action determination model (Klöckner, 2013).

The Norm activation model claims that individuals who blame other people, groups, and organizations, such as industrialization and government, for environmental problems will not feel obliged to be pro-environmental and that pro-environmental behavior can only develop when personal norms are activated. Moral responsibility for pro-environmental behavior is assumed (Steg & De Groot, 2010, pp. 726-729). According to the theory, when people feel they must do something for moral reasons, they exhibit pro-social behaviors in line with their value systems (Sarı, 2020, p. 216). The value-belief-norm model claims that people's values, ecological worldviews, and beliefs play a role in explaining their pro-environmental behavior. Stern et al. (1995) suggest that a causality chain with four variables, including values (biospheric, altruist, and egocentric), beliefs (awareness of the consequences of ecological worldview and taking responsibility), environmental, personal norms and behaviors (environmental activism, non-activist behaviors in the public sphere, private sphere behaviors, organizational sphere behaviors) results in pro-environmental behavior (Stern, 2000, pp. 83-84). The comprehensive action determination model suggests that many pro-environmental behavior styles can be better explained by adding the concept of habit to the planned behavior theory and norm activation model. Therefore, the model consists of five variables: personal choices, intent processes, perceived control/restrictions, habitual processes, social processes, and normative processes (Klöckner, 2013, pp. 1031-1032). This study uses the value-belief-norm model to explain pro-environmental behavior. According to all approaches that use a linear model to explain pro-environmental behavior, environmental awareness, values, and attitudes will develop pro-environmental behavior (Bozdemir, 2019, p. 47). In other words, as environmental awareness

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increases, concerns about environmental problems also increase (Karayeğen Balent, 2020, p. 147).

This study focuses on environmental citizenship and environmental activism variables such as joining or contributing to environmental organizations and supporting or accepting environmental public policies to measure urban planning students' pro-environmental behaviors. Because these types of behavior can affect public policies and change the behavior of many people and organizations simultaneously to solve environmental problems (Stern, 2000, pp. 409-411). Considering that planning, in the broadest sense, is to create a systematic series of actions to achieve a specific goal (Ersoy, 2007, p. 10), it is essential to understand how planning students transform theoretical information into practice to determine their opinions about environmental problems. Therefore, this study investigates how urban planning students evaluate the policies and strategies developed to create solutions to environmental problems.

STUDY METHOD

Selection and Method of Sampling

Study data were collected using a questionnaire in December and January of the 2021-2022 fall semester. The Department of Urban and Regional Planning (DURP) students in the Faculty of Architecture at Amasya University and Yıldız Technical University filled out the questionnaire form online. When selecting schools, Yıldız Technical University (YTU), which has had an urban and regional planning department since 1982, and Amasya University (AU), which has had an urban and regional planning department since 2012 as they successfully represent the schools that provide urban planning education. Both universities are state universities. YTU is in Istanbul, which is a large metropolitan city in Marmara Region, which is home to many civilizations with many natural and cultural heritage; AU is a moderate size city in the Central Black Sea Region, which has also been home to different civilizations, with natural and cultural heritage. In the 2021-2022 academic year, there were 590 students: 302 female and 123 male students in YTU DURP and 78 female and 87 male students in AU DURP. The total sample size was 233 for 590 students with a 95% confidence interval and ±0.05 sampling error. However, due to missing and incorrect entries, 226 questionnaires were included in the evaluation.

Questionnaire Form and Content

The questionnaire consists of five parts. The first part contains eight questions about respondents' socio-demographic characteristics, environmental knowledge and information (Figure 1). The second part contains 25 questions to evaluate respondents' environmental ethics approaches. Dunlap et al. (2000) and Özdemir's (2012) studies were used as references to develop the scale. The third part has ten questions to measure the pro-environmental behaviors of the respondents. This part includes pro-environmental activist behaviors (Müderrisoğlu & Altanlar,

2011). The fourth part uses a 12-item scale developed based on the work of Drescher et al. (2017) to evaluate respondents' perceptions of environmental policies. The questionaire's second, third, and fourth parts use a 5-point Likert scale.

Measurement Methods and Techniques

The study method was developed using the norm activation model (Steg & De Groot, 2010) and the value-belief-norm model (Stern, 2000) (Figure 1). Principal Component Analysis-TBA from exploratory factor analysis was used to determine the structural validity of the "environmental ethics approaches", "pro-environmental behavior", and "perception of environmental policies" scales. Kaiser-Meyer-Olkin (KMO) test was done to test the suitability of data structure for factor analysis for the sample size (Çokluk et al., 2010, p. 207). Since the environmental ethics value orientation scale is a multi-factor structure, the varimax rotation method, an orthogonal rotation, was used as the rotation method. Cronbach's alpha reliability test was used to determine the reliability of the scales. Skewness analysis was done to determine whether all data showed normal distribution at a 0.05 significance level. Kurtosis and skewness values within ±2.0 were considered to have a normal distribution (George & Mallery, 2010). Pearson correlation test was done to determine the relationship and strength between the respondents' environmental ethics and pro-environmental behavior and perception of environmental policies scale. One-way ANOVA was done to compare the scores of groups for a single variable, and a T-test was used for independent samples.

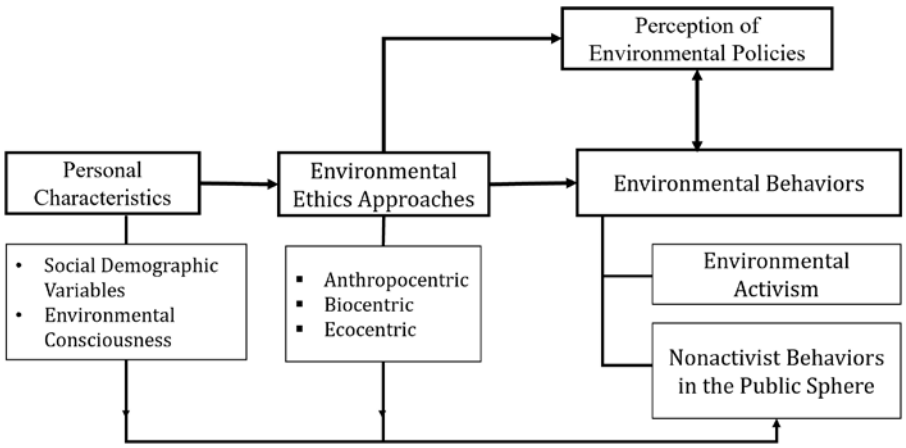

Figure 1. A conceptual model to measure pro-environmental behaviors of urban planning students with environmental ethics approaches

STUDY FINDINGS

A total of 226 questionnaires were included in the study. Students at Amasya University filled 37.6% of these, and those at Yıldız Technical University filled 62.4%. The gender distribution of the respondents is as follows: 64 male (28.3%) and 162 female (71.7%). 71.7% of the respondents are female because 64% of the students attending these two universities are female. To the question, "Do you have a budget for your

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hobbies and leisure activities after spending for your basic needs?", 18.6% of the respondents answered yes, 30.1% answered no, and 51.3% sometimes answered (Table 1). To the question "Have you ever had environmental education?", 57.1% of the respondents said yes, and 42.9% said no.

Table 1. Characteristics of Participant

Gender	Frequency	Valid Percent	University	Frequency	Valid Percent
Male	64	28.3	Amasya University	85	37.6
Female	162	71.7	Yıldız Technical University	141	62.4
Total	226	100.0	Total	226	100.0
Age	**Frequency**	**Valid Percent**	**Grade**	**Frequency**	**Valid Percent**
18 to 20	75	33.2	1. Grade	46	20.4
21 to 23	120	53.1	2. Grade	55	24.3
24+	31	13.7	3. Grade	62	27.4
			4. Grade	63	27.9
Total	226	100.0	Total	226	100.0
Can you allocate a budget for your hobbies?			**Which transportation mode do you use most between home and work/school/market?**		
Spending Level	**Frequency**	**Valid Percent**	**Preferred Mode of Transportation**	**Frequency**	**Valid Percent**
Yes	42	18.6	Walking	56	24.8
No	68	30.1	Public transport	154	68.1
Partly	116	51.3	Car	12	5.3
			Other	4	1.8
Total	226	100.0	Total	226	100.0

Results of Factor Analysis on Environmental Attitudes and Behaviors

Table 2 shows the results of factor distribution and reliability analysis of the items of the environmental ethics approaches to scale. KMO value was .863 in the KMO test. Based on this finding, it was concluded that the sample size was "sufficiently good" to carry out a factor analysis. Additionally, when Bartlett's spherical test results were reviewed, the chi-square value was found to be significant ($X^2_{(226)}$=2067.117; p=.000<,01). Therefore, it is possible to claim that data comes from the multi-variable normal distribution. The factor number was set to three when the Principal Component Analysis (TBA) screen plot graph was reviewed. This decision is also meaningful because it was similar to the factor number expected in theory identified in the tool development process. The total variance percentage of the three factors was 59.048, an acceptable variance percentage in social sciences (Çokluk et al., 2010, p. 249). Factor loads of the variables that constitute the three factors were higher than 0.400, and the Cronbach alpha value of each factor is higher than 0.7 (Bursal, 2019, p. 228; Hair et al., 2012). The first factor accounts for 23.853% of the total variance, and it is labeled as "biocentric ethics" since it contains expressions that promote the value and right to live of other living beings; the second factor accounts for 18.466% of the total variance, and it is labeled as "ecocentric ethics" since it focuses on the ecosystem and the environment instead of individual life forms; the third

factor accounts for 16.749% of the total variance, and it is labeled as "anthropocentric ethics" since it contains expressions that human interests have a value on their own (Table 2; Appendix 1).

Environmentalism intends to question production relationships and transform information into action while protecting of the natural environment. Many environmental movements claimed the above goals and defined themselves as environmentalists. The scale used to explain environmental behavior includes "public behavior", such as supporting pro-environmental government policies and "environmental activism", such as participating in mass protests or signing petitions. In the KMO test done to measure environmental behavior, the KMO value was found to be 0.851 ($X^2_{(226)}$=1128,676; p=.000<,01). In the TBA, when items in the first factor had high values whereas these values were low in the second factor and when there was an affinity between the eigenvalue of the second factor and the first factor, it was decided to have a single factor structure (Çokluk et al., 2010, p. 227). The factor accounts for 49.727% of the variance. Load values for all the items in the scale ranged between .615 - .756, and the reliability coefficient of the scale was .881. High scores on the scale indicate that students are willing to show pro-environmental behavior (Table 2; Appendix 2).

The KMO value of the scale developed to allow respondents to evaluate the environmental policies, including the measures and principles adopted to solve environmental problems was .963. ($X^2_{(226)}$=4258.685; p=.000<.01). Since there was a sudden drop in the line graph for the eigenvalue after the first factor, it was decided to have a single factor structure. The factor accounts for 84.532% of the variance. Load values for all the items in the scale ranged between .902 - .946, and the reliability coefficient of the scale was .983 (Table 2; Appendix 3).

Table 2. TBA Analysis and Reliability Analysis Results of the Scales

SCALES	KMO[a]	Number of Items	Factor Loads[b]	Explained Rate of Variance (%)	Eigen-values	Cronbach's Alpha Coefficient(α)[c]
Environmental Ethics	.863	21	.486-.800	59.048	-	.908
-Biocentric	-	10	.486-.748	23.853	4.294	.883
-Ecocentric	-	6	.588-.755	18.446	3.320	.805
-Anthropocentric	-	5	.635-.800	16.749	3.015	.804
Environmentally Friendly Behavior	.851	10	.615-.756	49.727	4.973	.881
Perceiving of Environmental Policies	.963	12	.902-.946	84.532	10.144	.983

[a] If the KMO value is between 0.80-.90, it is good, and above 0.90, it is excellent.
[b] If the factor load value is between 0.55-0.62 is good; 0.63-0.70 is very good; 0.71+ is perfect.
[c] If the Cronbach's alpha value is (α) ≥ 0 .9 it is excellent;** 0.9 > α ≥ 0.8 is good, *0.8 > α ≥ 0.7 it is acceptable (Çokluk et al., 2010).

Relationship between Variable Scores of the Urban Planning Students and Factors

A skewness analysis was done to analyses whether the data had a normal distribution. A kurtosis value of ±1.0 for normal distribution is

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considered perfect for most psychometric goals; however, depending on the practice, a kurtosis value of ±1.5 (Tabachnick & Fidell, 2013) and a kurtosis value of ±2.0 is also accepted (George & Mallery, 2010). As seen in Table 3 and Table 4, since skewness and kurtosis values of the variables range within ± 2, a significance level of .05 meets the usual distribution requirement. Similarly, when the normality of the sub-groups created according to the categories of the same independent variable compared to dependent variables is reviewed, skewness and kurtosis values variables range within ± 2 (Table 3). Based on the correlation results between the environmental ethics approaches and pro-environmental behavior and perception of environmental policies scale shown in Table 4, for ecocentric students (r= .175; n=177; p=.02), a weak positive relationship was found between environmental ethics approaches and pro-environmental behavior, but no relationship was found with the perception of environmental policies. No meaningful relationship was found between the pro-environmental behavior scale and the evaluation of environmental policies of the biocentric and anthropocentric students (Table 4).

Table 3. Results of Normality Analysis of Variables and Factors

Variables		Statistic	Std. Error
Age	Skewness	.229	.162
	Kurtosis	-.731	.322
Gender	Skewness	.969	.162
	Kurtosis	-1.071	.322
University	Skewness	-.515	.162
	Kurtosis	-1.750	.322
Grade	Skewness	-.158	.162
	Kurtosis	-1.288	.322
Can you allocate a budget for your hobbies?	Skewness	-.639	.162
	Kurtosis	-.227	.217
Have you received any environmental education?	Skewness	-.827	.431
	Kurtosis	1.4292	.03300
Where did you receive your environmental education?	Skewness	-.227	.243
	Kurtosis	-.747	.423
Which transportation mode do you use most between home and work/school/market?	Skewness	-.639	.162
	Kurtosis	-1.040	.322
Scales			
Biocentric Ethics	Skewness	-1.301	.240
	Kurtosis	1.044	.476
Ecocentric Ethics	Skewness	-.585	.240
	Kurtosis	-.124	.476
Anthropocentric Ethics	Skewness	1.239	.240
	Kurtosis	1.601	.476
Environmentally Friendly Behavior	Skewness	-.184	.240
	Kurtosis	.472	.476
Environmental Policies Perception	Skewness	-.349	.240
	Kurtosis	-1.091	.476

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Table 4. Pearson Correlation Analysis Results of the Scales

		BE	EE	AE	EFB	EPP
Biocentric Ethics (BE)	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	177				
Ecocentric Ethics (EE)	Pearson Correlation	-.062	1			
	Sig. (2-tailed)	.415				
	N	177	177			
Anthropocentric Ethics (AE)	Pearson Correlation	-.041	-.015	1		
	Sig. (2-tailed)	.588	.843			
	N	177	177	177		
Environmentally Friendly Behavior (EFB)	Pearson Correlation	.085	.175*	.095	1	
	Sig. (2-tailed)	.260	.020	.210		
	N	177	177	177	226	
Environmental Policies Perception (EPP)	Pearson Correlation	-.043	.093	-.088	.100	1
	Sig. (2-tailed)	.566	.217	.245	.134	
	N	177	177	177	226	226

** Correlation is significant at the 0.05 level (2-tailed).*

*If Pearson correlation r<0.2 very weak or no correlation, between, 0.4-0.6 moderate correlation 0.6-0.8 high correlation 0.8> very high correlation; **P≤0.01, *0.01<P≤0.05.*

When we looked at the correlation results between personal characteristics and environmental ethics, pro-environmental behavior, and evaluation of environmental policies (Table 5);

- A weak positive relationship was found between the age variable and only pro-environmental behaviors (r = .183; n=177; p=.006),
- A significant relationship was found only between the gender variable and anthropocentric value orientation (r = .192; n=177; p=.010),
- A weak negative relationship was found between the universities they attend and pro-environmental behavior (r = -.187; n=226; p=.005) and evaluation of environmental policies (r = -.189; n=226; p=.004),
- A weak negative relationship was found between environmental education and pro-environmental behavior (r =-.284; n=226; p=.000),
- A weak positive relationship was found between having a budget for hobbies and biocentric environmental ethics (r =.171; n=177; p=.023),
- A weak negative relationship was found between the transportation method used to commute between home and school and anthropocentric approaches (r=-.149*; n=177; p=0.048) and similarly pro-environmental behavior (r=-.150*; n=226; p=0.024),
- No meaningful relationship was found between the school year and environmental ethics approaches, pro-environmental behavior styles, and evaluation of environmental policies.

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Table 5. The Relationship between the Socio-demographic Characteristics of the Participants and their Scale Scores

		CORRELATION				
Variables		**BE**	**EE**	**AE**	**EFB**	**EPP**
Age	Pearson Correlation	.006	.044	-.054	.183**	.015
	Sig. (2-tailed)	.934	.564	.478	.006	.823
	N	177	177	177	226	226
Gender	Pearson Correlation	-.090	-.109	.192*	-.028	.027
	Sig. (2-tailed)	.234	.147	.010	.679	.689
	N	177	177	177	226	226
University	Pearson Correlation	.040	-.139	-.141	-.187**	-.189**
	Sig. (2-tailed)	.601	.065	.062	.005	.004
	N	177	177	177	226	226
Grade	Pearson Correlation	-.006	.040	-.010	.091	.004
	Sig. (2-tailed)	.934	.594	.898	.175	.950
	N	177	177	177	226	226
Can you allocate a budget for your hobbies?	Pearson Correlation	.171*	-.128	-.130	.016	-.028
	Sig. (2-tailed)	.023	.089	.085	.813	.672
	N	177	177	177	226	226
Have you received any environmental education?	Pearson Correlation	.030	.053	.093	-.284**	-.125
	Sig. (2-tailed)	.695	.487	.218	.000	.061
	N	177	177	177	226	226
Where did you receive your environmental education?	Pearson Correlation	-.042	.073	.076	.091	.075
	Sig. (2-tailed)	.673	.459	.436	.303	.398
	N	106	106	106	129	129
Which transportation mode do you use most between home and work/school/market?	Pearson Correlation	-.080	-.016	-.149*	-.150*	-.106
	Sig. (2-tailed)	.290	.836	.048	.024	.112
	N	177	177	177	226	226

BE: Biocentric Ethics, EE: Ecocentric Ethics, AE: Anthropocentric Ethics, EFB: Environmentally Friendly Behavior, EPP: Environmental Policies Perception

** Correlation is significant at the 0.05 level (2-tailed).*

*If Pearson correlation r<0.2, very weak or no correlation, between 0.4-0.6 moderate correlation, 0.6-0.8 high correlation, 0.8> very high correlation; **P≤0.01, *0.01<P≤0.05.*

Finally, one-way variance analysis (ANOVA) was done to see the differences between the students' personal characteristics and scale scores, and a complementary post-hoc analysis was done to identify the causes of the differences. Since variances obtained from the post-hoc tests done to identify the causes of the difference between pro-environmental scores and age groups were not equal (F=5.322; p=0.006<0.05), "Games-Howel" test was done (Kayri, 2009, p. 56). According to the "Games-Howel" multiple comparison tests, a significant difference was found between the mean pro-environment behavior scores of the students who were 24 and older ($F_{(3-1)}$=.66796911*, P=.004<0.05) and of the students who were 21-23 years old ($F_{(3-1)}$=.66796911*, P=.004<0.05) and of the students who were 21-23 years old ($F_{(3-2)}$=.56617629*, P=.006<0.05) (Table 6). In other words, as the respondents' age increases, they feel more responsible for the environment.

T-test was done to test how the respondents' mean scores for the "environmental ethics approach", "pro-environmental behavior styles", and "evaluation of environmental policies" scales differ according to the gender and university variable. According to the findings, women had more anthropocentric value orientation than men [$F_{(M-F)}$= 0.421058; p=.013<0.05] (Table 7). Additionally, as seen in Table 8, students who reported having prior education on the environment adopt more pro-environmental behavior styles [$F_{(Y-N)}$= 0.573891; p=.000<0.05].

Table 6. Results of the Post-hoc (Games Howell) Test of Environmentally Friendly Behavior Scores by Age Groups

Games-Howell				P	95% Confidence Interval	
Age Groups	Age Range	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
18 to 20	21 to 23	-.10179282	.15678426	.793	-.4736198	.2700341
	24 +	-.66796911*	.20461846	.005	-1.1571988	-.1787394
21 to 23	18 to 20	.10179282	.15678426	.793	-.2700341	.4736198
	24 +	-.56617629*	.17407302	.006	-.9872393	-.1451133
24 +	18 to 20	.66796911*	.20461846	.005	.1787394	1.1571988
	21 to 23	.56617629*	.17407302	.006	.1451133	.9872393

Table 7. T-Test Results for Comparison of Environmental Ethics Approaches Scale Scores by Gender Differences

Factors	Gender	N	Mean	Std. Deviation	Std. Error Mean	Levene's Test for Equality of Variances		T-Test for Equality of Means
						F	Sig.	Sig. (2-tailed)
Anthropo-centric Ethics	Female	124	-.1197551	.97372487	.08744308	.004	.013	.010
	Male	53	.3013033	1.02564818	.14088361			.013*

Table 8. T-Test Results for Comparison of the Scores of Environmentally Friendly Behavior Scale of Environmental Education Students

Factors	Have you received environmental education?	N	Mean	Std. Deviation	Std. Error Mean	Levene's Test for Equality of Variances		T-Test for Equality of Means
						F	Sig.	Sig. (2-tailed)
Environ-mentally Friendly Behaviors	Yes	129	.2526801	.97159459	.08554413	.154	.695	.000*
	No	97	-.3212105	.94963615	.09642094			.000

The correlation analysis found a significant difference between the student's scores in pro-environmental behavior and environmental policies scale according to the university they studied (Table 9). According to the study findings, the students in AU showed more pro-environmental behavior compared to the students in YTU [$F_{(AU-YTU)}$ = 0.385793; p=.005<0.05]. The opposite was found for the evaluation of environmental policies; urban planning students in YTU perceive environmental policies more negatively than the students in AU [$F_{(YTU-AU)}$= -0.392736; p=.004<0.05].

Table 9. T-Test Results for Comparison of Scale Scores According to the Universities (Where They Studied)

Factors	University	N	Mean	Std. Deviation	Std. Error Mean	Levene's Test for Equality of Variances		T-test for Equality of Means
						F	Sig.	Sig. (2-tailed)
Environmentally Friendly Behaviors	AU	85	.2470581	.94683693	.10269888	1.143	.286	.005*
	YTU	141	-.1387350	1.00868167	.08494632			.004
Perceiving of Environmental Policies	AU	85	.2499740	.87920687	.09536337	6.830	.010	.004*
	YTU	141	-.1427618	1.05341007	.08871313			.003

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DISCUSSION AND CONCLUSION

Environmental challenges faced at every scale in our age call for global and local policy-making and planning to take necessary measures to sustain the habitat we live in. Ecology is a primary interdisciplinary science covering the social and political spheres of these challenges, and planning is crucial to the existence and the remedy of ecological challenges. However, the knowledge gap between planning, ecology and environmental ethics contradicts attitudes towards nature. (Özgür, 2020)

Everything from how we perceive life to behave is defined by our personal beliefs, attitudes, and values. Values are general goals that act like guiding principles in our lives (Bozdemir, 2019, p. 44). Many factors play a role in adopting pro-environmental behavior in theories. Previous studies have shown that environmental behaviors are associated with personal factors such as socio-demographic characteristics, values, beliefs, and norms (Müderrisoğlu & Altanlar, 2011; Stern et al., 1995; Stern, 2000). This study demonstrates the relationship between value orientation and pro-environmental behavior tendencies and perception of environmental policies according to personal characteristics. The literature demonstrates that individuals with egoistic value orientation tend to show less pro-environmental behavior, while people with strong biospheric value orientation tend to show more pro-environmental behaviors (Karayeğen Balent, 2020, p. 158; Kıral Uçar, 2020, p. 806). The study's findings are comparable to the findings of similar studies. This study's findings show that urban planning students are willing to show pro-environmental behavior. Based on the study findings, urban planning students adopt biocentric, ecocentric, and anthropocentric value orientations. These results also show that urban planning education plays an influential role in respondents adopting biocentric and ecocentric value orientations. However, study findings demonstrate that only ecocentric students tend to show pro-environmental behavior. No significant difference was found between respondents' value orientations and perception of environmental policies.

As with similar studies, this study's findings also suggest that environmental attitudes are shaped by socio-demographic values that affect social structure and environmental behavior (Aminrad et al., 2011; Müderrisoğlu & Altanlar, 2011; Sasidharan & Thapa, 1999, p. 60). Stern et al. (1995) reported that women are better at understanding the importance of the environment for social welfare, personal well-being, and for the world to be a better place (Stern et al., 1995). This study shows that women tend to show more pro-environmental behavior than men. Additionally, as the mean age of the respondents increases, they tend to have more pro-environmental behavior.

Some studies suggest significant differences in people's environmental attitudes according to their place of residency (Sasidharan& Thapa, 1999, p. 60). Furman (1998, pp. 528-529) reported that people living in cities are more interested in environmental

problems than people living in rural areas. Cary (1993) reported that being away from environmental problems made it difficult to understand these problems. This study supports these findings. According to the study findings, students' environmental attitudes differ according to the university they attend and the city they live in. The study findings show that urban planning students in a moderate size city (AU) have a higher tendency to show pro-environmental behavior compared to urban planning students attending a university in a larger city (YTU). Furthermore, more students studying in a large city (YTU) reported that environmental policies are insufficient to protect the environment than the urban planning students studying in a moderate size city (AU).

The literature shows that early experiences in the natural environment and environmental education affect the development of values in adulthood (Yaban, 2020, p.305). Studies focused on environmental education suggest that students who have more courses on environment support life-centered attitudes (Müderrisoğlu & Altanlar, 2011, p. 160). Environmental experiences, especially in childhood, are a determining factor in developing ecological identity. Yaban (2020, p.305) reports that teenagers who spend more time in nature during their childhood have positive perceptions about nature and choose activities such as nature walks compared to those who spend time in their garden before age ten. Keleş (2007) showed that science and technology teacher candidates had increased environmental awareness and sustainable living after completing their courses on ecological footprint, and increasing awareness levels had a positive effect on the attitudes and behaviors of teacher candidates (Keleş, 2007, p. 101). As with similar studies, this study also demonstrates that students who receive environmental education before their bachelor's degree tend to show more pro-environmental behavior (Wong, 2003; Morgil et al., 2004).

Additionally, study findings show that students with relatively better economic conditions are more inclined to have a biocentric value orientation. Based on the literature and these study findings, pro-environmental behavior is not a single-dimensional structure caused only by individuals' personal and professional characteristics. It can be suggested that people's environmental attitudes and behaviors are shaped by their upbringing, school, friends, and culture. Those upbringings show that pro-environmental behavior has a multi-dimensional complex structure, and a conceptual framework can provide guidance to explain these kinds of behavior. In conclusion, focusing on ecocentric approaches in urban planning education can result in more positive outcomes for adopting pro-environmental behavior and policies. In other words, as theoretical and practical courses in urban planning education cover economic, social, cultural, political, natural, and built environments, it is impossible to omit values and ethical approaches from the curriculum. If the long-term goal of urban planning education is to improve and maintain environmental quality, information on its own will

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not be sufficient. An effective education program that will help people develop ethical rules should be designed. However, an education program emphasizing environmental values is believed to increase urban planning students' knowledge and awareness. It can be suggested that students who adopt ecocentric and biocentric approaches can be more effective in creating sustainable plans and providing guidance to decision-makers to implement policies aiming to achieve this. Providing education within this framework and including more courses on environmental values as a priority will play an influential role in developing and implementing policies that are effective in environmental protection and the prevention of environmental problems. Thus, it can be possible for urban planning students to develop a holistic approach to ecology and natural resources management. By supporting an education program that helps students to have ecocentric value orientations, students can take action to prevent the destruction of the natural environment by people and provide information to and warn decision-makers and society about dangers, despite all kinds of economic and political conditions in their social and professional lives.

This study has some limitations. In 2021, there were 33 universities in Türkiye with urban and regional planning departments. However, this research only surveyed urban and regional planning students from two state universities. Therefore, the results obtained from this study cannot be generalized to all students, but they can provide some insights.

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APPENDICES

Appendix 1. Environmental Ethics Approaches (Value Orientations) Factor Analysis Results

Components		Factor Load[a]	Explained Rate of Variance (%)	Eigenvalues	*Cronbach's Alpha Coefficient (α)[b]
	Environmental Ethics Scale		59.048	-	0.908
Biocentric Ethics	Every living being has its right to preserve and maintain its existence.	.748	23.853	4.294	0.883
	We need to treat animals at least as well as we treat humans.	.729			
	Animals have feelings like humans.	.728			
	Other living beings want to live as humans do.	.687			
	Humans are severely abusing the natural environment.	.684			
	The main reason behind the deterioration of nature is a consumption-dependent lifestyle.	.667			
	Those who do not love other living beings also do not love humans	.658			
	The earth is like a spaceship with very limited room and resources.	.600			
	If things continue on their present course will soon experience a major ecological catastrophe.	.545			
	The balance of nature is very delicate and easily disturbed.	.486			
Ecocentric Ethics	Human ingenuity will ensure that we do not make the earth unlivable.	.755	18.446	3.320	0.805
	A simple life in harmony with nature is better than a modern life dependent on technology.	.680			
	Global warming can only be prevented with the renunciation of lifestyles resulting in the exploitation of nature	.632			
	The main reason for the deterioration of nature is the desire for steady progress.	.618			
	We are approaching the limit of the number of people that the earth can support.	.601			
	When humans interfere with nature, it often produces disastrous consequences.	.588			
Anthropocentric Ethics	The so-called ecological crisis facing humankind has been greatly exaggerated.	.800	16.749	3.015	0.804
	Humans have the right to modify the natural environment to suit their needs.	.794			
	Humans were meant to rule over the rest of nature.	.718			
	The existence of living beings not useful to human beings is not important.	.675			
	Plants and animals are living beings that exist to serve humans.	.635			

[a] If the factor load value is between 0.55-0.62 it is good; 0.63-0.70 is very good; 0.71+ is perfect.
*[b] If Cronbach's alpha value is (α) ≥ 0.9 it is excellent; ** 0.9 > α ≥ 0.8 is good, *0.8 > α ≥ 0.7 is acceptable (Çokluk et al., 2010).*

Appendix 2. Environmentally Friendly Behavior Patterns Factor Analysis Results

Environmentally Friendly Behavior Scale	Factor Load[a]	Explained Rate of Variance (%)	Eigenvalues	*Cronbach's Alpha Coefficient (α)[b]
I donate money or paid membership dues to a conservation organization.	.734	49.727	4.973	.881
I enroll in a course for the sole purpose of learning more about environmental issues.	.753			
I talk to others about environmental issues.	.756			
I watch TV programs about environmental problems.	.702			
I read publications that I can do to help solve environmental issues.	.711			
I write to our elected officials expressing my opinions on environmental problems.	.656			
I investigate our elected officials voting record on environmental issues.	.699			
I vote for a politician due to his/her record on protecting the environment.	.615			
I use legal measures to stop events I thought would damage the environment.	.704			
I report environmental crimes to the proper authorities.	.709			

[a] If the factor load value is between 0.55-0.62 is good; 0.63-0.70 is very good; 0.71+ is perfect.
*[b] If Cronbach's alpha value is (α) ≥ 0 .9 is perfect ;** 0.9 > α ≥ 0.8 is good, *0.8 > α ≥ 0.7 is acceptable (Çokluk et al., 2010).*

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Appendix 3. Environmental Policies Perception Scale

Environmental Policies Perception Scale	Factor Load[a]	Explained Rate of Variance (%)	Eigenvalues	*Cronbach's Alpha Coefficient (α)[b]
Measures were taken to protect the ecosystem.	.946	84.532	10.144	.983
Measures taken against climate change.	.932			
To carry out studies to prevent air pollution.	.929			
Measures were taken against environmental pollution due to industrial and domestic waste.	.929			
To protect and manage forests to ensure their sustainability.	.928			
Sustainable management of wetlands (waterways, shore, lake, etc.)	.919			
Conservation and control of green areas (parks, gardens, groves, meadows, etc.) ensure their continuity.	.911			
Measures to control population growth.	.911			
Measures were taken against the pollution of clean and potable water resources.	.910			
Protecting endangered plants and animal species.	.910			
Promoting natural heritage conservation	.905			
Conservation of biodiversity.	.902			

[a] *If the factor load value is between 0.55-0.62 is good; 0.63-0.70 is very good; 0.71+ is perfect.*
[b] *If Cronbach's alpha value is (α) ≥ 0.9 is perfect; ** 0.9 > α ≥ 0.8 is good, *0.8 > α ≥ 0.7 is acceptable (Çokluk et al., 2010).*

Resume

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