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RESEARCH ARTICLE

Analysis of University Students' Awareness towards Renewable Energy: The Case of Atatürk University

Okan Demir[1]✉ • Gizem Çağlar Gültekin[2]

[1]Atatürk University, Faculty of Agriculture, Department of Agricultural Economics, Erzurum/Türkiye
[2]Atatürk University, Institute of Science, Erzurum/Türkiye

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ABSTRACT

This study aims to analyze the awareness levels of renewable energy among students at Atatürk University and identify factors influencing this awareness. The research involved a face-to-face survey conducted in 2023 with 320 university students selected through random sampling. The survey utilized a 5-point Likert-type renewable energy awareness scale developed by Morgil. Additionally, socio-demographic data such as age, gender, parents' education levels, and whether students had received education in renewable energy or related courses were collected. An ordered probit model was developed based on the collected data, and the model was found to be statistically significant. Results indicated that gender, mother's education level, and receiving energy-related education significantly affected renewable energy awareness. Specifically, female students demonstrated higher awareness levels compared to males, and taking energy courses positively influenced awareness. Conversely, age and father's education level were not found to have a significant impact on awareness. Literature supports the finding that mother's education plays a more decisive role in shaping children's environmental awareness. The findings suggest that strengthening environmental and energy education within university curricula, developing targeted programs to reduce gender-based awareness disparities, and organizing educational activities aimed at raising environmental consciousness among families are crucial. Implementing these strategies is expected to enhance renewable energy awareness and contribute to the development of a sustainable society.

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1. Introduction

One of the most significant environmental and economic challenges facing the world today is the issue of sustainability in energy production and consumption. The use of fossil fuels—particularly coal, oil, and natural gas—causes severe environmental damage, leading to negative outcomes such as air pollution, global warming, and the depletion of natural resources. Despite the vast global potential of renewable energy sources, an examination of the types of energy consumed reveals that oil ranks first, followed by coal and natural gas. In the distribution of global primary energy supply in 2020, oil ranked first with 171.4 EJ, accounting for 29.1% of total supply. It was followed by coal with 155.8 EJ (26.5%) and natural gas with 139.1 EJ (23.7%). Renewable energy sources, by contrast, met only 11.6% of the primary energy supply, amounting to 68.3 EJ. Between 1973 and 2019, global primary energy

✉ Correspondence
E-mail address: okandemir@atauni.edu.tr

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consumption saw a 456% increase in the share of nuclear energy, a 147% increase in renewable energy sources, a 44% increase in natural gas, and an 8.5% increase in coal, while the share of oil decreased by 34% (Yılmaz & Türkyılmaz, 2022). The increased use of fossil fuels leads to the accumulation of carbon dioxide and other greenhouse gases in the atmosphere, thereby exacerbating the problem of climate change. Globally, energy production still relies heavily on fossil fuels, a situation that intensifies carbon emissions and creates irreversible effects on ecosystems. Environmental problems such as global warming and climate change clearly demonstrate that the continued use of such fuels is unsustainable. In this context, the importance of renewable energy sources is increasing day by day, and solutions are being sought for clean and sustainable energy production.

Renewable energy is derived from natural sources that are constantly replenished. These sources include solar, wind, hydroelectric, geothermal, biomass, and wave energy. Due to its environmentally friendly characteristics, renewable energy causes significantly less harm compared to fossil fuels, does not pollute natural resources, and aims to leave a more livable world for future generations. In recent years, both developed and developing countries have aimed to increase the share of renewable sources in energy production. In line with this objective, investments in renewable energy have been rising, and large-scale projects are being implemented worldwide. However, for these projects to succeed and become widespread, it is essential to raise public awareness in this field and to increase interest in and demand for renewable energy.

Increasing public awareness of renewable energy holds critical importance, particularly for younger generations. As individuals who will play a key role in shaping society, university students significantly influence energy consumption habits, environmental responsibility, and sustainability awareness. Through the knowledge and skills acquired during their academic education, university students not only gain information about renewable energy but also enhance their awareness in this domain. Therefore, understanding university students' awareness of renewable energy provides valuable insights for both educational and energy policy development. Students' attitudes toward energy can influence their environmental sensitivity as well as their future energy consumption behaviors.

Awareness of renewable energy has the potential to influence not only the individual attitudes of students but also broader societal transformations. As younger generations gain access to information regarding renewable energy, they can serve as conduits for disseminating this knowledge to other segments of society, thereby contributing to meaningful progress in environmental sustainability. In this context, educational institutions can play a pivotal role by emphasizing the importance of renewable energy sources and encouraging students to become actively engaged in the learning process. However, the effectiveness of such efforts is closely linked to the overall level of awareness students possess on the subject. Therefore, analyzing university students' levels of awareness regarding renewable energy can serve as a valuable reference point in both educational and societal contexts.

This study aims to analyze the level of awareness regarding renewable energy among students at Atatürk University. Atatürk University is a well-established institution of higher education that encompasses a wide range of academic disciplines. The student body comprises individuals from diverse socio-economic backgrounds, which contributes to a variety of perspectives and thought processes. How does awareness of renewable energy vary among these students? To what extent are they knowledgeable about renewable energy? Do they possess a level of awareness sufficient to drive meaningful change in this area? The answers to these questions are expected to provide a valuable roadmap for strengthening university-level educational programs and enhancing students' sense of environmental responsibility.

Today, energy efficiency and sustainable energy production hold significant importance not only from an environmental perspective but also from an economic standpoint. Investments in renewable energy contribute to economic growth by generating new employment opportunities. Therefore, awareness of renewable energy should encompass not only environmental concerns but also economic implications. University students, as future professionals who may work in fields such as energy management, sustainable development, and environmental engineering, possess the potential to transfer the knowledge they acquire to both industry and society. Consequently, university students' awareness of renewable energy plays a critical role in achieving society's goal of a sustainable future.

In conclusion, the utilization of renewable energy sources plays a critical role in meeting future energy demands and ensuring environmental sustainability. In this context, increasing university students' awareness of renewable energy will pave the way for a broad environmental transformation within society and contribute to the development of a more conscious and responsible generation.

2. Methodology

This study was approved in advance by Faculty of Agriculture Ethics Committee of Atatürk University with the decision number 2025/1 on 16.09.2025.

2.1. Data

The data used in this study were obtained through face-to-face surveys conducted with students of Atatürk University in 2023. The number of surveys to be administered was determined using the Simple Random Probability Sampling

Method Based on Main Population Proportions. In the preliminary study conducted for the field, it was determined that the knowledge and awareness rate of the students regarding renewable energy was 30% and p=0.30 was used in the formula. Participants were randomly selected, and a total of 320 surveys were administered. The formula used to calculate the sample size was as follows,

$$n = \frac{N*p*(1-p)}{(N-1)\sigma_{px}^2+p(1-p)} \quad (1)$$

n= sample size,

N= the number of students at Ataturk University's central campus,

p= The proportion of students with knowledge and awareness about renewable energy (%30),

r= mean deviation (%5),

σ_{px}^2= Variance (0.000651)

$$\sigma_{px}^2 = \left(\frac{r}{z_{\alpha/2}}\right)^2 = \left(\frac{0.05}{1.96}\right)^2 = 0.000651$$

$$n = \frac{45\,000*0.3*(0.7)}{(44\,999)*0.0255^2+(0.3*0.7)} = 320$$

The data collection instrument employed was the Renewable Energy Awareness Scale developed by Morgil et al. (2006), which consists of Likert-type items rated on a 5-point scale. The first section of the questionnaire included 22 Likert-type questions designed to assess students' awareness of renewable energy. The second section collected socio-demographic information such as age, gender, educational level, university entrance exam type, and parental education levels. The Likert scale responses ranged from "strongly agree" (5) to "strongly disagree" (1).

2.2. Empirical Methodology

Attitude determination data concerning renewable energy, collected using the Likert scale, is categorical and ordinal in nature. As such, one of the most suitable evaluation methods for analyzing such data is the ordered probit or logit models (Davidson & MacKinnon, 2003; McKelvey & Zavoina, 1975; Wooldridge, 2010). In this study, the attitudes of university students toward renewable energy were analyzed using the Ordered Probit Model estimation technique. When the dependent variable is categorical or ordinal, ordered logit or probit models, which utilize probit or logit probability estimators, are appropriate. Both approaches rely on Maximum Likelihood estimation techniques. The ordinal probit model is based on the assumption of a normal probability distribution, whereas the ordinal logit model is derived from the standardized logistic probability distribution. A key distinction between the ordinal probit and ordinal logit models is the underlying assumption about the distribution of errors: the former assumes a normal distribution. In the context of the ordered probit model, it is posited that a continuous but unobservable latent dependent variable underlies the observable, interval, and ordered categories (y). This latent variable (y*) is modeled as a function of the explanatory variables and an error term. It is assumed that the error term has a normal distribution (Greene, 2008).

$$n = t\hat{}[1 + (0{,}02)(b-1)] * pq/E\hat{}2 \quad (2)$$

In the ordered probit model, it is hypothesized that a continuous yet unobservable latent dependent variable underlies the observable, interval, and ordered categories (y). The latent variable (y*) is modeled as a function of a vector of explanatory variables and an error term. It is further assumed that the error term follows a normal distribution (Greene, 2012).

$$Y^* = X'\beta + \varepsilon\varepsilon \sim N[0,1] \quad (3)$$

Here, y*; unobservable dependent variable, x; vector of explanatory variables, β; parameter vector to be estimated and ε; indicates the error term. The relationship between the dependent variable (y) and the unobserved dependent variable (y*) is considered as a function of the threshold values (μj) that take separate values according to the consumers and are estimated using the regression coefficients (β). In the research, the attitudes level of the university students were classified in four different sequential categories (Y= 0, 1, 2, 3). According to this; The relationship between the dependent variable (y) of the model and the unobserved dependent variable (y*) will be as follows (Chen et al., 2002; Greene, 2012).

$$İf\ y^* \leq 0 \qquad y=0 \quad (4)$$
$$İf\ 0 < y^* \leq \mu_1 \qquad y=1 \quad (5)$$
$$İf\ \mu_1 < y^* \leq \mu_2 \qquad y=2 \quad (6)$$
$$İf\ \mu_2 < y^* \leq \mu_3 \qquad y=3 \quad (7)$$
$$İf\ \mu_3 \leq y^* \qquad y=4 \quad (8)$$

The "μ" values in the equation represent the threshold values estimated within the model, which define the lower and upper bounds of the values that the dependent variable y can take (Greene, 2008). For the purpose of this study, the independent variable was recategorized based on the average scores of the responses provided by university students to the renewable energy awareness questions. Specifically, students with an average score of up to 1.4 were classified as having a very low level of awareness, those with an average score ranging from 1.5 to 2.4 were categorized as having a low level of awareness, those with an average score between 2.5 and 3.4 were considered to have a medium level of awareness, those with an average score between 3.5 and 4.4 were regarded as having a high level of awareness, and those with an average score greater than 4.5 were classified as having a very high level of awareness.

The ordinal categories of the dependent variable used in the model are as follows: "Y = 0" represents a very low level of awareness, "Y = 1" indicates a low level of awareness, "Y = 2"

corresponds to a medium level of awareness, "Y = 3" denotes a high level of awareness, and "Y = 4" signifies a very high level of awareness.

In the ordered probit model, the error term is assumed to follow a normal distribution. The probability that students will fall into one of the five attitude categories is given by the following equation (Bozoğlu et al., 2016; Bozoğlu et al., 2022; Greene, 2012).

$$\text{Prob}\,(y = 0|x) = \Phi\,(-x'\beta), \quad (9)$$

$$\text{Prob}\,(y = 1|x) = \Phi\,(\mu_1 - x'\beta) - \Phi\,(-x'\beta), \quad (10)$$

$$\text{Prob}\,(y = 2|x) = \Phi\,(\mu_2 - x'\beta) - \Phi\,(\mu_1 - x'\beta), \quad (11)$$

$$\text{Prob}\,(y = 3|x) = \Phi\,(\mu_3 - x'\beta) - \Phi\,(\mu_2 - x'\beta), \quad (12)$$

$$\text{Prob}\,(y = 4|x) = 1 - \Phi\,(\mu_3 - x'\beta) \quad (13)$$

For the probabilities to remain positive, it must hold that $0 < \mu1 < \mu2$. The symbol **ϕ** represents the cumulative normal distribution function. Interpreting the coefficients of the variables in an ordered probit model, which is estimated using the maximum likelihood method, is not straightforward (Akbay et al., 2007). This is because the effects of explanatory variables on probabilities depend on the values of the explanatory variables themselves, meaning they are not directly equivalent to the parameter (β) estimates. Without further computation, it is unclear how to interpret the coefficients in the ordered probit model. Therefore, to understand the impact on probabilities, it is necessary to calculate the marginal effects of the explanatory variables. The marginal effects for each probability are computed as follows (Greene, 2012).

$$\partial prob(y = 0|x))/\,\partial x = -\emptyset(x^{\wedge\prime}\beta)\beta, \quad (14)$$

$$\partial prob(y = 1|x))/\,\partial x = [\emptyset(-x^{\wedge\prime}\beta)\beta, -\emptyset(\mu1 - x^{\wedge\prime}\beta)\beta], \quad (15)$$

$$\partial prob(y = 2|x))/\,\partial x = [\emptyset(\mu1 - x^{\wedge\prime}\beta) - \emptyset(\mu2 - x^{\wedge\prime}\beta)]\beta, \quad (16)$$

$$\partial prob(y = 3|x))/\,\partial x = [\emptyset(\mu2 - x^{\wedge\prime}\beta) - \emptyset(\mu3 - x^{\wedge\prime}\beta)]\beta, \quad (17)$$

$$\partial prob(y = 4|x))/\,\partial x = [\emptyset(\mu3 - x^{\wedge\prime}\beta)\beta, \quad (18)$$

The ordered probit model, which is one of the limited dependent variable model types, was estimated using the Limdep Econometric Computer Program.

3. Results and Discussion

The renewable energy awareness model utilized six independent variables. These variables include age, gender, mother's educational level, father's educational level, whether the individual has received education on renewable energy, and whether they have taken courses related to energy.

Among the survey participants, 2.2% (7 individuals) exhibited very low awareness of renewable energy, 13.1% (42 individuals) low awareness, 23.1% (74 individuals) moderate awareness, 28.8% (92 individuals) high awareness, and 32.8% (105 individuals) very high awareness. The average age of the participants was 22.6 years. Of the respondents, 36.3% (116 individuals) were female, and 63.7% (204 individuals) were male. The university entrance exam type was coded as quantitative and others. Among the participants, 68.1% (218 individuals) were admitted through the quantitative exam type, while 31.9% (102 individuals) were admitted through other exam types.

Parental educational levels were included as categorical variables in the model, coded from one to six, corresponding to primary school, middle school, high school, associate degree, bachelor's degree, and graduate education, respectively. Among the surveyed students, 8.4% (27 individuals) of their mothers had completed primary school, 10.9% (35 individuals) middle school, 58.8% (188 individuals) high school, 14.1% (45 individuals) associate degree, 7.2% (23 individuals) bachelor's degree, and 0.6% (2 individuals) graduate education. Regarding fathers, 1.2% (4 individuals) had primary school education, 2.2% (7 individuals) middle school, 20.9% (67 individuals) high school, 42.8% (137 individuals) associate degree, 30.6% (98 individuals) bachelor's degree, and 2.1% (7 individuals) graduate education. The variable indicating whether students received education on renewable energy was binary; 21.3% (68 individuals) reported having received such education.

Table 1. Definitions of the model variables.

Variable Name	Variable Definition
AGE	Age (year)
GENDER	Female:0 Male: 1
MOTHER_EDU	Mother education (categoric)
FATHER_EDU	Father education (categoric)
ENERGY_COURSE	If the student takes about energy: 1; other: 0
EDUCATION_LEVEL	Graduate: 1 Undergraduate: 0

The chi-square value of the constructed ordered probit model was found to be 34.82, which is statistically significant at the 1% level. The threshold values of the model represent critical points used to determine students' levels of awareness. Since significant differences were observed between the threshold values, it can be concluded that transitions between categories within the model are meaningful.

According to the model results, the age variable was found to be insignificant and had no effect on the level of awareness. Marginal effects also indicate a negative impact across all categories, and the effect of age on awareness categories is not statistically significant. These marginal effects demonstrate that age does not lead to any meaningful change in any of the awareness levels. Therefore, age neither increases nor decreases the level of awareness.

Individual and socio-demographic factors influencing environmental awareness in societies have gained increased importance in recent years within the framework of sustainability discussions. Within this context, the age factor is

frequently examined in terms of its role in shaping environmental attitudes and behaviors. However, the literature often reports that the effect of age on environmental awareness is weak or limited. For instance, Gifford (2011) emphasizes that a direct and strong relationship between age and environmental awareness cannot be established, although younger individuals tend to exhibit more environmentally friendly behaviors. Similarly, Kollmuss and Agyeman (2002) state that age does not have a significant impact on environmental attitudes, yet they acknowledge that younger people tend to be more sensitive to environmental issues. These findings are further supported by Steg and Vlek (2009)'s research, which suggests that environmental education is particularly effective among younger individuals. Therefore, age is regarded less as a decisive factor on awareness itself and more as a variable that clarifies the effects of environmental education.

The gender variable emerges as a stronger factor influencing attitudes toward environmental awareness. Women are considerably more likely than men to possess higher levels of environmental awareness. Marginal effects indicate that female students are 21.27% more likely to fall into the "very high" awareness category. This finding suggests that women tend to be more sensitive to environmental issues and more inclined toward pro-environmental behaviors. For example, Zelezny et al. (2000) reported that women are more responsible and engaged regarding environmental concerns, while Kollmuss and Agyeman (2002) emphasized that women are more likely to assume greater environmental responsibilities. Additionally, the study by Fielding and Head (2012) noted that although men may have more knowledge about energy technologies, awareness levels are shaped not only by knowledge but also by attitudes and behaviors. Conversely, some studies such as Oral (2020) have found that the effect of gender on awareness is not statistically significant. Similarly, Tiftikçi (2014) reported no significant difference in awareness levels between female and male students. Nevertheless, the general trend indicates that women exhibit greater sensitivity to environmental issues. In this context, awareness-raising policies focusing on women may yield more effective results for societal transformation.

Mother's educational level has a significant impact on individuals' awareness of environmental issues. In particular, having a mother with higher education contributes to children becoming more conscious about environmental matters. Marginal effects indicate that an increase in the mother's educational level is associated with a 6.70% higher likelihood of transitioning to the "very high" awareness category. The literature includes numerous studies demonstrating that parents' educational levels enhance children's environmental sensitivity. Tiftikçi (2014) reported that students' awareness of renewable energy varies according to their parents' educational levels, with this effect being more pronounced in mothers' education. Similarly, studies by Collins et al. (2007) and Franzen and Vogl (2013) found that children of educated mothers tend to develop higher awareness of environmental issues. This is attributed to the influence mothers have on their children through socialization processes within the household, which plays a decisive role in shaping this awareness. Thus, the increase in mothers' renewable energy education level plays a positive role in both children's environmental attitudes and behavioral awareness. However, for these effects to be stronger, parents themselves need to be more environmentally conscious and transmit this awareness to their children.

On the other hand, the effect of father's educational level on awareness is considered to be more limited. As the father's educational level increases, the likelihood of students transitioning to lower awareness categories increases by 1.41%; however, this effect is weak and not statistically significant. This finding indicates that the impact of father's education on environmental awareness is less pronounced. The influence of father's educational level on environmental consciousness is generally addressed only marginally in the literature. Although fathers' education contributes to an individual's overall education, certain studies focusing specifically on environmental awareness have found this effect to be less evident. For instance, model findings indicate that an increase in father's education may slightly increase the probability of students remaining in the low awareness category, but this relationship is not statistically robust. This aligns with literature supporting the notion that mothers play a more dominant social role in shaping children's values and attitudes.

Another important factor influencing individuals' environmental awareness levels is formal education related to environmental or energy topics. Energy-related education and courses play a significant role in enhancing students' environmentally friendly behaviors and their sensitivity toward renewable energy. It is frequently noted that specific educational programs, such as energy courses, increase students' knowledge levels and consequently strengthen their environmental sensitivity. Students who have taken renewable energy and environmental courses have been found to exhibit higher levels of environmental awareness. Marginal effects indicate that taking an energy course increases the likelihood of students transitioning to the "very high" awareness category by 6.87%. Mertoğlu (2019) found that taking energy courses enhances students' awareness of renewable energy; similarly, Steg and Vlek (2009) emphasize that environmental education is an effective method for developing awareness. Kollmuss and Agyeman (2002) assert that environmental education creates strong and lasting effects, particularly on young individuals. Owens and Driffill (2008), along with Barth et al. (2012), also argue that education on environmental issues has the potential to transform individuals' behaviors. In this context, taking energy courses not only facilitates knowledge acquisition but also makes significant contributions to the development of environmentally friendly attitudes and behaviors.

General education level may not always be a decisive factor affecting the level of awareness. Although there is a general tendency in the literature indicating that environmental awareness increases with higher education levels (Van Liere & Dunlap, 1980), this relationship is not always linear or strong. Particularly among higher education levels (undergraduate and postgraduate), significant changes in awareness levels may not be observed. Barr et al. (2011) explain this by emphasizing that environmental awareness is shaped not only by the level of education but also by participation in specific educational programs. Therefore, the lack of a significant difference in environmental awareness between postgraduate and undergraduate students is closely related to the type and content of the education received. Consequently, it can be concluded that participation in environment-themed programs has a more pronounced effect on awareness than the general level of education.

Table 2. Ordered Probit model results.

Variables	Estimated coefficient	Marginal effects				
		Y=0 (very low)	Y=1 (low)	Y=2 (medium)	Y=3 (high)	Y=4 (very high)
Constant	4.66770*** (0.0010)					
AGE	-0.02097 (0.6674)	0.00010 (0.6662)	0.00096 (0.6662)	0.00133 (0.6705)	0.00226 (0.6674)	-0.00465 (0.6664)
GENDER	-0.91987*** (0.0005)	0.00550*** (0.0049)	0.05099*** (0.0030)	0.06461** (0.0166)	0.09157*** (0.0034)	-0.21267*** (0.0003)
MOTHER_EDU	0.30186*** (0.0074)	-0.00145** (0.0104)	-0.01389*** (0.0093)	-0.01911** (0.0309)	-0.03252** (0.0277)	0.06697*** (0.0075)
FATHER_EDU	-0.29458* (0.0707)	0.00141* (0.0795)	0.01356* (0.0771)	0.01865 (0.1043)	0.03173 (0.1049)	-0.06535* (0.0728)
ENERGY_COURSE	0.30943*** (0.0023)	-0.00148*** (0.0044)	-0.01424*** (0.0037)	-0.01959** (0.0210)	-0.03333** (0.0156)	0.06865*** (0.0024)
EDUCATION_LEVEL	-0.08939 (0.8609)	0.00044 (0.8662)	0.00426 (0.8656)	0.00579 (0.8641)	0.00959 (0.8604)	-0.02008 (0.8626)
Mu (01)	2.46250*** (0.0000)					
Mu (02)	3.44310*** (0.0000)					
Mu (03)	4.63358*** (0.0000)					
Log likelihood function	-303.35893					
Restricted log likelihood	-320.76957					
Chi squared [6 d.f.]	34.82128					
Significance level	0.00000					

Note: ***, **, * denote significance levels at 1%, 5%, 10% respectively. The number in parentheses indicate p values.

4. Conclusion and Policy Implications

In this study, a probit model was employed to analyze university students' awareness of renewable energy. The results of the model revealed how various demographic and educational factors influence students' levels of awareness regarding renewable energy. The conducted analyses, alongside comparisons with existing literature, enable the formulation of several recommendations aimed at enhancing university students' awareness of renewable energy.

Strengthening environmental education curricula at the university level is crucial for increasing awareness of renewable energy. In particular, energy courses should be designed to enable students to acquire more knowledge about renewable energy and environmental issues. These courses should place greater emphasis on topics such as energy efficiency, the importance of renewable energy sources, and their environmental impacts.

The model revealed that female students have higher awareness of renewable energy compared to their male counterparts. This finding indicates that women tend to be more sensitive to environmental consciousness. Therefore, encouraging female students more actively and promoting their participation in leadership positions can contribute to enhancing environmental awareness and renewable energy consciousness. At the same time, targeted training programs or awareness-raising activities can be organized for male students.

It has been determined that the mother's education level has a significant impact on renewable energy awareness. Therefore,

organizing educational programs aimed at families is important to foster environmental consciousness among students. Seminars and workshops designed to raise environmental awareness can be conducted for families.

In order to raise general awareness about renewable energy within society, campaigns can be organized on university campuses and targeted at local community groups. These campaigns may include informational activities focused on promoting energy conservation and renewable energy, particularly aimed at encouraging environmentally friendly behaviors.

When considering gender differences, it has been observed that male students have lower awareness of renewable energy compared to female students. Therefore, targeted educational programs or awareness-raising activities can be organized specifically for male students. Such initiatives may help to balance the awareness gap between genders.

The finding that age has a limited effect on environmental awareness suggests that environmental education should be designed to address individuals regardless of their age. Therefore, it is important that educational programs aimed at increasing environmental consciousness are developed to reach broader audiences across all age groups, rather than being limited solely to younger individuals.

Awareness of renewable energy among university students is influenced by factors such as gender, educational background, and particularly whether students have taken energy-related courses. The findings of this study highlight the necessity of developing strategies aimed at enhancing environmental awareness. When the proposed strategies are implemented within educational institutions, families, and society at large, it is expected that the level of awareness regarding renewable energy will increase.

Compliance with Ethical Standards

This study was approved in advance by Faculty of Agriculture Ethics Committee of Atatürk University with the decision number 2025/1 on 16.09.2025.

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Conflict of Interest

The authors declare no conflict of interest.

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