



Environmental Awareness Among University Students at King Faisal University: College of Law and Arts - A Statistical Study

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Abstract

This study assessed the level of environmental awareness among students of the Faculty of Law and the Faculty of Arts (Geography) at King Faisal University through its cognitive, skill-based, and emotional dimensions. The research examined students' environmental knowledge, awareness of environmental laws, participation in environmental activities, and concern for environmental issues. It was hypothesized that students would demonstrate a high level of environmental awareness, with Geography students and female students exhibiting higher levels than their counterparts. Data was collected using a questionnaire developed in accordance with King Faisal University's research ethics guidelines. The instrument measured environmental awareness across three dimensions: cognitive, skill-based, and emotional. Data was analyzed using SPSS. Reliability was assessed using Cronbach's alpha, and normality testing indicated that the data did not meet parametric assumptions. Consequently, nonparametric statistical tests were employed, including the Mann–Whitney U test and the Kruskal–Walli's test. The findings revealed comparable levels of environmental awareness across the three dimensions, with no statistically significant differences among the cognitive, skill-based, and emotional dimensions. Although Geography students obtained slightly higher mean ranks than Law students, these differences were not statistically significant. Similarly, no statistically significant differences were found according to gender. Overall, the results indicate that students demonstrated similar levels of environmental awareness regardless of academic specialization or gender.

Keyword's: King Faisal University; Environmental awareness; Cognitive dimension; Skill-based dimension; Emotional dimension; Environmental knowledge; Environmental attitudes; University students; Law students; Geography students; Gender differences.

Introduction

Comprehensive awareness of ecosystem determinates, alongside their resilience and capacity to absorb environmental stresses, constitutes a critical factor in countering anthropogenic impacts and mitigation of their severity. An advanced understanding of ecosystem determines resilience, and buffering capacity is crucial for mitigating environmental degradation. Consequently, evaluating environmental concern, awareness, and pro – environmental behaviors among community members exerts substantially positive impact on environmental sustainability (Ahmad *et al.*, 2020). Consequently, modern societies heavily rely on highly educated demographics to spearhead these mitigation efforts, particularly as ecological crises - such as anthropocentrically driven pollution, global warming, and desertification- continue to intensify (Al- Naem, 2020).

Environmental protection and national resources conservation have been integral components of Saudia Arabia's national development agenda since the establishment of the National Commission of Wildlife Conservation and Development in 1986. This commission was further strengthened with the lunch of Saudi Vision 2030 on April 16, 2016, which introduced a comprehensive framework aimed at enhancing quality of life, addressing environmental and climate -related challenges associated with population growth, and achieving sustainable development objectives (Hegazy, 2024).

Within the framework of Saudi Vision 2030, the Kingdom of Saudi Arabia has adopted a sustainability-driven development paradigm that seeks to reconcile economic growth environmental sustainability and responsible natural resources management. To advance these objectives, the government has implemented a wide range of initiatives aimed at enhancing vegetation cover, mitigating land degradation, restoring ecosystems, and strengthening environmental resilience. These efforts support comprehensive environmental policies, regulatory reforms and government framework designed to conserve terrestrial and marine biodiversity, protect ecological assets, and promote the long-term sustainability of natural ecosystems. Such measures reflect the Kingdoms' strategic commitments to integrating environmental consideration into national development planning and achieving a balanced approach to economic social and environmental progress (Aldosari, 2026) The Saudi Green initiative represents a cornerstone of Saudi Arabia's environmental sustainably strategy, focusing on expanding protected terrestrial and marine areas, promoting renewable energy development, and reducing greenhouse gas emissions. Through ambitious conservation and climate action targets , including increased biodiversity protection and substantial carbon emission reducing by 2030, the initiative supports the Kingdoms commitment to achieving national sustainability objectives contributing to global climate mitigation efforts (Aldosari, 2026)

The achievement of these objectives is supported through partnerships with international organizations, including the International Union for Conservation of National (IUCN), with contributes to the biodiversity and the protection of the Kingdoms unique natural ecosystems for future generations. Recent studies have hilted that Saudi Arabs environmental

policies under vision 2030 represent a strategic shift toward integrating environmental sustainability into national development planning and governance (Hegazy, 2024)

Human capital development has become a key pillar of environmental sustainability in Saudi Arabia. In alignment with vision 2030, higher education institutions have expanded environmental education and specialized academic programs, while awareness campaigns and professional training initiatives have enhanced strengthen the institutional and human resources required to achieve the Kingdoms long -term sustainability goals (SPA, 2017).

King Faisal University has also joined in these efforts. In addition to its academic programs in the Colleges of Arts and Agriculture, and environmental law in the College of Law, the university has established a dedicated environmental protection unit and organized conferences such as the Second International Conference on Food Security and Environmental Sustainability (King Faisal University Conference Services, 2021). These developments highlight the importance of researching the level of environmental awareness and understanding among university students and aim to address the following questions:

- Are students in university aware of the current concepts related to the environment.
- Are students aware of penalties and punishments when violating environmental laws?
- Are students participating in voluntary environmental protection campaigns.
- To what extent do students care about environmental problems

The main objective of this study is to assess the level of environmental awareness among students of the Faculty of Law and the Faculty of Arts (Geography). Specifically, the study aims to examine environmental awareness in the cognitive dimension, assess students' environmental skills, and identify their emotional attitudes toward environmental issues, with comparisons made according to academic specialization. To this end, the research seeks to measure the cognitive, skill and emotional dimensions of students towards environmental issues. The research hypothesizes that:

- Students of the Faculty of Arts (Geography) and the Faculty of Law demonstrate a high level of environmental awareness, given that both academic programs include courses related to environmental law.
- Geography students in the Faculty of Arts possess a higher level of environmental awareness than Law students, due to the greater number of environmentally related courses included in the geography program.
- Female students exhibit a higher level of environmental awareness compared to male students, based on the generally higher academic performance of females.

Literature Review

Environmental awareness can be defined, as noted by the United Nations (UNESCO-United Nations Environment Programming, 1983), as the process of developing and enhancing individuals' awareness and understanding of the biophysical environment and related issues, including the impacts of human activities and the interactions between humans and the environment. Environmental awareness is a concept that originates with the individual, yet its effects extend to society as a whole, as it helps equip individuals with the knowledge, skills, values, and attitudes necessary to preserve and improve the environment in a way that meets the requirements of sustainable development for current and future generations. It also works to promote positive behaviors and practices toward the environment and encourages individuals to adopt more responsible ways of thinking and acting when dealing with various environmental issues (Mravcova, 2019).

Environmental awareness is defined as the set of ideas, beliefs, feelings, and behaviors that students practice or adopt, and which often reflect students' interest in and knowledge of environmental issues (Berrichi, Djafour, 2025).

Environmental awareness is defined as a system of experiences, knowledge, and insights that an individual uses in the process of interacting with the surrounding environment. In other words, the individual empathizes with the environment and recognizes that it is part of their development and an inseparable component of their life, making respect an essential element of the awareness process. From a multidimensional approach and an analytical perspective, environmental awareness is divided into four dimensions: emotional, cognitive, volitional, and behavioral (Quispe, *et al.*, 2023). A study by (Pedersen, 1999) used factor analysis, which yielded six dimensions of environmental competence. Based on these factors, six measures were identified: accuracy, external skills, trend identification, knowledge, practical skills, and resource conservation.

This study adopted three dimensions: the cognitive dimension, the skill dimension, and the emotional dimension.

Cognitive dimension: Refers to the level of information and knowledge students possess regarding the environmental reality at the university. It takes into account the level of accessible information, regardless of whether it is general or specific in nature (Quispe, *et al.*, 2023).

Skill dimension: This refers to students' behaviors and practices within the university environment.

Emotional dimension: This dimension refers to citizens' concerns regarding the extent to which the environment upholds various values such as cultural values related to the protection of the environment and nature-as well as the state of the environment (Quispe, *et al.*, 2023).

With regard to environmental protection and raising awareness of conservation, environmental movements have emerged around the world that engage in collective action, with individuals working to combat deforestation and organizations and local communities working to combat pollution, global warming, and climate change phenomena that have come to threaten the environment in particular and the Earth in general. This is evident in air pollution, which is considered one of the major environmental hazards. This pollution stems from industrial emissions, transportation, and the burning of biomass; it is linked to the spread of noncommunicable diseases as well as environmental degradation, and it creates conditions conducive to the proliferation and spread of disease vectors (Huanca *et al.*, 2025). (Uzundumlu & Tosun, 2025) noted that environmental pollution has negative effects on living organisms and contributes to the emergence of certain health problems in society and among individuals.

Similarly, (Ul Haq *et al.*, 2025) in their study, which aimed to examine environmental awareness among college students through online community participation. This study highlighted the pivotal role of college students' participation in online communities particularly social media platforms, enhancing their environmental awareness and found a strong positive

correlation between university students' engagement in their online communities and their level of environmental awareness. Closer to the field of social media was a study by Widdatallah & Abdallah, (2025) which linked the role of the media and legal education to increasing environmental awareness and promoting environmentally friendly behaviors on campus. This study confirmed that the media is an effective tool for promoting environmental responsibility on campus in light of university students' legal awareness.

This study aligned with previous studies in its use of a quantitative approach to the same topic, namely environmental awareness.

Methodology and Materials

This study is based on primary data collected through a structured questionnaire administered to students from the Department of Geography in the College of Arts and the College of Law at King Faisal University. The data collection process adhered to the university's research ethics guidelines. The questionnaire comprised three dimensions cognitive, skill-based, and emotional each containing a set of items designed to measure environmental awareness.

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS). Cronbach's alpha was employed to assess the reliability and internal consistency of the questionnaire, while a normality test was conducted to determine whether the data followed a normal distribution. Given the distributional characteristics of the data, non-parametric statistical methods were utilized. Specifically, the Mann-Whitney U test was used to compare two independent samples, and the Kruskal-Wallis test was applied for comparisons involving three or more independent samples. The study included several comparative analyses:

- Comparison between the three axes of the questionnaire (environmental awareness axes) based on students' opinions.
- A comparison of environmental awareness dimensions based on students' academic disciplines (Law vs. Geography).
- A comparison of environmental awareness dimensions based on gender (male vs. female students).

The research methodology comprised multiple phases: (1) data collection; (2) review of relevant literature and prior studies; (3) statistical analysis, including reliability testing, data normalization, and the application of non-parametric tests; and (4) the evaluation of specific statistical hypotheses through comparative analysis of student responses across the questionnaire's three axes:

- There are no statistically significant differences between the three axes of the study (Cognitive dimensions, Skill dimensions and Emotional dimensions).
- There are no statistically significant differences between law and geography students according to the three axes of the study (Cognitive dimensions, Skill dimensions and Emotional dimensions).
- There are no statistically significant differences between male and female students according to the three axes of the study (Cognitive dimensions, Skill dimensions and Emotional dimensions).

Hypothesis testing is a fundamental scientific procedure used to determine whether a proposed statement should be accepted or rejected based on empirical evidence. In statistical analysis, two primary approaches are employed to test hypotheses: (i) the parametric approach and (ii) the nonparametric approach. The parametric approach relies heavily on certain assumptions, most notably the normality of the data distribution, and, in some cases, the homogeneity of population variances. However, in many practical scenarios, these assumptions are difficult to satisfy. As a result, nonparametric methods, which do not require strict distributional assumptions, are frequently used as robust alternatives to parametric tests. (Sherwani, et al., 2021)

Mann-Whitney U test

The Mann-Whitney U test, also referred to as the Wilcoxon rank-sum test, is a non-parametric statistical method used to compare two independent groups when the dependent variable is either ordinal or continuous but does not follow a normal distribution. This test is particularly suitable for small sample sizes or when the assumptions required for parametric tests—such as normality and homogeneity of variances are violated, especially in the presence of skewed data. (Park. Y,2025).

However, the asymptotic properties of the Wilcoxon-Mann-Whitney test, as commonly applied, are valid only under the condition that the two underlying distributions are identical, i.e., $F_1 = F_2$. Consequently, the null hypothesis is typically formulated in terms of the equality of the distribution functions, $H_0: F_1 = F_2$ against $H_1: F_1 \neq F_2$ (two-sided) or $F_1 > F_2$, $F_1 < F_2$ (one-sided), rather than in terms of the Mann-Whitney parameter p as such. While the condition $F_1 = F_2$ implies that $p = \frac{1}{2}$, the converse is not necessarily true (Nowak, et al. 2025).

The Mann-Whitney test statistic is defined as (Jonathan, 2004)

$$W^* = \sum_{i=1}^m \sum_{j=1}^n U_{ij} / mn \quad (1)$$

Kruskal-wallis test

In 1952, Kruskal and Wallis introduced a robust rank-based statistical test for the k-sample problem as a non-parametric alternative to parametric methods such as one-way analysis of variance (ANOVA). The Kruskal-Wallis H test has since been widely employed in various analytical contexts (Sherwani, et al., 2021)

As a non-parametric method, it does not require the assumption that the data follows a specific probability distribution. The Kruskal-Wallis H test is particularly useful when the assumptions underlying ANOVA such as the assumption of normality are violated. The Kruskal-Wallis test is sometimes referred to as a "one-way ANOVA on ranks" because it operates on the ranks of the data rather than the raw data values. The primary objective of the test is to determine whether there are statistically significant differences in the medians across more independent groups (Mujeeb Abd, 2024), with the Kruskal-Wallis H test, most applied when comparing three or more independent groups. The test assumes that observations are independent both within and between groups. In other words, there should be no relationship among observations within each group. (E.I, Lelwala, et al., 2024).

Like other statistical tests, a test statistic is computed and compared to a critical value from the appropriate reference distribution. In the Kruskal-Wallis test, this statistic is known as H statistic. The hypotheses for the test are:

H_0 : population medians are equal.

H_1 : population medians are not equal.

Kruskal-Walli's test will tell you if there is a significant difference between groups. However, it won't tell you which groups are different.

For that, you'll need to run a Post Hoc test (Mujeeb Abd, 2024).

Kruskal and Wallis (1952) suggested the following test statistics for the investigation of significant differences among samples based on their means (E.I, Lelwala, et al. 2024).

$$H = \frac{12}{N(N+1)} \sum_{i=1}^c \frac{R_i^2}{n_i} - 3(N+1) \quad (2)$$

Where C denotes the number of samples, n_i is for the number of observations in the sample, $N = \sum n_i$ which is the number of observations in all samples combined, and R_i is the sum of the ranks in this sample.

Kruskal-Wallis Test-Assumptions:

- The assumptions underlying the Kruskal-Walli's test are similar to those of the Mann-Whitney U test and include the following:
- The samples are random, or participants are randomly assigned to treatment groups.
- The samples are mutually independent, meaning that observations are independent both within and across groups.
- The dependent variable is measured on at least an ordinal scale and is assumed to be continuous. (Mujeeb Abd, 2024)

Results and discussion

The findings demonstrate strong validity and confirm the reliability and efficiency of the questionnaire in generating accurate and meaningful results. The instrument proved effective in producing valid measurements for each of the three dimensions cognitive, skill-based, and emotional both individually and collectively. The analysis revealed no statistically significant differences across the three dimensions of environmental awareness (cognitive, skill-based, and emotional). This validates the second research of the first research hypothesis, which states that: There are no statistically significant differences between the three axes of the study as the analysis below will demonstrate.

Similarly, no statistically significant differences were found between students from the College of Law and the Department of Geography across the three dimensions of the study terms of their responses across the cognitive, skill-based, and emotional dimensions. Furthermore, the results indicated no statistically significant differences between male and female students in terms of their responses across the cognitive, skill-based, and emotional dimensions.

The data were analyzed using the SPSS program, applying descriptive statistics and assessing validity and reliability through Cronbach's Alpha. Additionally, nonparametric tests were conducted, including the Mann-Whitney test, which compares two independent samples that do not follow a normal distribution, and the Kruskal-Walli's test, which compares more than two such samples.

Table (1) descriptive statistics and reliability coefficient

Phrase	Cronbach's Alpha if Item Deleted	Mean	Std. Deviation	Phrase direction
Define the term environment.	.968	4.1946	.90552	agree
Determine the causes of pollution.	.968	4.2550	.89408	strongly agree
List Degrees of desertification	.967	3.6309	1.09883	agree
Analyze the effects of global warming	.968	3.5839	1.11562	agree
Prove the impact of overpopulation on environmental problems.	.968	3.8926	1.05357	agree
Explain the need to use alternative energy	.968	3.9329	1.06330	agree
Evaluate human being role in environmental pollution	.968	4.2349	.85732	strongly agree
Give examples of environmental violations in Al-Ahsa Governorate.	.968	4.1342	.88270	agree
Mention the objectives of the Saudi environmental law.	.968	3.8993	1.11346	agree
Explain the most important articles of Saudi Environmental Law.	.967	3.7450	1.15755	agree
Classify the regulatory approvals necessary for practice of environmental activities in accordance with provisions of Saudi Environmental Law.	.967	3.7987	1.05254	agree
Classify violations related to the practice of environmental activities in accordance with provisions of Saudi Environmental Law.	.967	3.8591	1.09062	agree
Choose the penalties that need to be taken for waste-related violations, based on Saudi Environmental Law.	.967	3.9866	1.05258	agree
Compare the Saudi environmental law within the framework of the Kingdom's obligations to international conventions.	.967	3.7517	1.10836	agree

Explain the penalties for environmental violations.	.967	3.8926	1.05997	agree
Explain to my colleagues the environmental problems.	.967	3.9195	1.08750	agree
Observe indicators of water pollution.	.968	3.9664	1.06806	agree
Implement guidelines for the use of public gardens and parks.	.968	4.2550	.93110	strongly agree
Carry out some recycling of paper, plastic or other waste.	.968	3.9799	1.02976	agree
Implement controls to put waste in place.	.968	4.3087	.90717	strongly agree
Volunteer in afforestation campaigns.	.968	3.8658	1.14878	agree
Participate in environmental sanitation campaigns, clean streets, and public facilities.	.968	3.8792	1.12654	agree
Donate my money and effort to environmental protection associations.	.968	3.6779	1.22623	agree
Practice every behavior that leads to conservation of water and electricity.	.968	4.1544	.97762	agree
Watch movies and scientific programs about environmental protection.	.968	3.5570	1.27015	agree
Express my opinion in scientific platforms and public debates on environmental problems.	.967	3.6376	1.20368	agree
Differentiate between the environmental laws' protection in Saudi Environmental Law.	.967	3.8188	1.13336	agree
Judge the type of environmental violation considering Saudi environmental law.	.967	3.8389	1.07217	agree
Arrange the stages of the steps of judicial proceedings for environmental violations.	.967	3.6980	1.14316	agree
Present an intervention on controlling violations and inflicting penalties on environmental law at the Environmental Week ceremony at the university.	.967	3.6443	1.21407	agree
Feel good being in a clean environment.	.968	4.5839	.79781	strongly agree
Interested in scientific environmental research.	.968	3.8121	1.19892	agree
Concerned about the worsening problem of desertification around Al-Ahsa Oasis.	.968	4.2081	.96755	strongly agree
Disturbed by poor rainwater drainage planning in some cities.	.969	4.5101	.78514	strongly agree
Prefer planning of industrial areas away from residential neighborhoods in cities.	.969	4.3893	.89073	strongly agree
Call on factory owners to commit to caring for and afforesting the environment.	.968	4.5973	.75265	strongly agree
Justify the feasibility of using paper bags instead of plastic	.968	4.2282	.91623	strongly agree
Interested in the laws of protecting the environment in the Kingdom of Saudi Arabia.	.968	4.3221	.79923	strongly agree
Interested in news and programs related to the environment in audio-visual media.	.967	3.7919	1.16986	agree
Call for punishment for those who pollute the environment and harm its resources.	.968	4.2617	.88069	strongly agree
Realize a positive change over time in my attitudes towards environmental protection.	.968	4.2416	.83546	strongly agree
Welcome to developmental projects planning considering their future environmental impact assessment.	.968	4.3758	.75763	strongly agree
Disturbed by news of a high percentage of carbon dioxide in the atmosphere.	.968	4.2215	.86872	strongly agree
Prefer to follow up the activities of associations for environmental protection.	.967	3.9329	1.10076	agree
Cronbach's Alpha for all	.968			

The table above explains Cronbach's Alpha for both individual phrases and the overall questionnaire. With a value close to one, this indicates a high level of reliability and internal consistency, confirming that the questions effectively measure what they were designed to assess.

The validity coefficient was determined by calculating the square root of 0.968, resulting in a high value of 0.984 (98%). This suggests strong validity, demonstrating the questionnaire's efficiency and its ability to produce clear and valid results. The table also explains the arithmetic mean, standard deviation, and trend for each questionnaire phrase.

Analysis results of axes of environmental awareness:**Table (2) descriptive statistics and reliability coefficient of three axes**

	N	Mean	Std. Deviation	Std. Error	Cronbach's Alpha if Item Deleted	Validity coefficient
Cognitive axis	149	58.7919	11.64177	.95373	.802	0.896
Skill axis	149	58.2013	12.69708	1.04019	.777	0.881
Emotional axis	149	59.4765	8.84291	.72444	.851	0.922
Total	447	58.8233	11.16660	.52816	.856	0.925

The table above explains Cronbach's Alpha for the axes of questionnaire. With a value greater than 0.5, this indicates a high level of reliability and internal consistency, confirming that the questions of axes effectively measure what they were designed to assess.

The table also explains the arithmetic mean, standard deviation, Std. Error (standard error of mean) of questionnaire axes. The table above explains Cronbach's Alpha for the axes of questionnaire. With a value greater than 0.5, this indicates a high level of reliability and internal consistency, confirming that the questions of axes effectively measure what they were designed to assess.

The validity coefficient was determined by calculating the square root of Cronbach's Alpha, yielding high values of 0.984 (98%) for the Cognitive axis, 0.881 (88%) for the Skill axis, and 0.922 (92%) for the Emotional axis. The overall validity coefficient for the three axes combined was 0.925 (93%). These results indicate strong validity, confirming the questionnaire's reliability and its effectiveness in producing clear and valid measurements both for each axis individually and for the three axes collectively. The table also explains the arithmetic mean, standard deviation, Std. Error (standard error of mean) of questionnaire axes.

Table (3) Data normality of three axes

Tests of Normality						
Phrase	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Students' knowledge of the concepts and laws of the environment	.098	149	.001	.950	149	.000
Students' protection of the environment according to their awareness of its problems	.093	149	.003	.947	149	.000
Students' interest in environmental issues	.121	149	.000	.920	149	.000

a. Lilliefors Significance Correction

The Shapiro-Wilk test is commonly used to test normality for group sample sizes (N) less than 50, Kolmogorov-Smirnov is useful for larger samplings (N>50) (Ahmed & Hamarai)

- P-value (sig) in all phrases are less than 0.05, meaning the data doesn't follow a normal distribution. Because the data doesn't follow normal distribution, researchers can use nonparametric tests to analyze the data.

Table (4) Mean rank of three axes

Ranks			
	x	N	Mean Rank
dimensions	Cognitive axis	149	225.23
	Skill axis	149	221.07
	Emotional axis	149	225.70
	Total	447	

The table above presents a sample size of 149 for each axis, with mean ranks of 225.23 for cognitive dimensions, 221.07 for skill dimensions, and 225.70 for emotional dimensions.

Table (5) Kruskal Wallis Test

Test Statistics ^{a,b}	
	y
Chi-Square	.116
df	2
Asymp. Sig.	.944
a. Kruskal Wallis Test	
b. Grouping Variable: x	

The table above shows the results of the Kruskal Wallis test, in which we find that the chi-square value is equal to 0.116 with a degree of freedom of 2 and a significance level (Asymp. Sig.) of 0.944, which is a value greater than 0.05, which means that there are no statistically significant differences between the three axes of the study (Cognitive dimensions, Skill dimensions and Emotional dimensions)

The results presented in Tables 4 and 5 may be attributed to the accuracy and comprehensiveness of course specifications at King Faisal University, which are developed in accordance with the guidelines and updates issued by the National Center for Academic Accreditation and Evaluation in Saudi Arabia. These specifications incorporate cognitive, skill-based, and affective learning outcomes, as well as appropriate teaching strategies and assessment methods. Cognitive outcomes focus on students' understanding of the facts, concepts, principles, theories, processes, and procedures associated with their disciplines. Skill-based outcomes emphasize critical thinking, problem-solving, inquiry, and creativity, while affective outcomes aim to instill values, ethical standards, and professional principles that guide graduates' behavior and contribute to their success in life and professional practice (<https://etec.gov.sa/ar/home>).

This comprehensive approach may explain the close similarity among the mean scores of the three dimensions of environmental awareness (Table 4) and the absence of statistically significant differences among them (Table 5), indicating comparable levels of environmental awareness among students of the two colleges. Furthermore, the study plans of both colleges include courses with environmental and legal orientations. In the Department of Geography, Faculty of Arts, students study courses such as Environmental Problems and Hazards and Environmental Legislation, while students in the Faculty of Law take courses such as Judicial Organization in the Kingdom and the Saudi Environmental Law System. These courses collectively contribute to strengthening students' environmental awareness across cognitive, skill-based, and affective dimensions.

The relationship between the axes of environmental awareness based on the perspectives of law and Geography students

Table (6) Mean rank and sum of rank of law and geography

	Ranks			
	Student's specialization	N	Mean Rank	Sum of Ranks
Students' knowledge of the concepts and laws of the environment	Law	99	73.63	7289.50
	Geography	50	77.71	3885.50
	Total	149		
Students' protection of the environment according to their awareness of its problems	Law	99	72.21	7148.50
	Geography	50	80.53	4026.50
	Total	149		
Students' interest in environmental issues	Law	99	70.86	7015.00
	Geography	50	83.20	4160.00
	Total	149		

The table above explains follow:

- For law, the sample size was 99, while for geography, it was 50.
- Students' knowledge of the concepts and laws of the environment was assessed across two subjects. For law, a mean rank of 73.63 and a total rank of 7289.50. For geography, a mean rank of 77.71 and a total rank of 3,885.50.
- Students' protection of the environment according to their awareness of its problems was assessed across two subjects. For law, a mean rank of 72.21 and a total rank of 7148.50. For geography, a mean rank of 80.53 and a total rank of 4026.50.
- Students' interest in environmental issues was assessed across two subjects. For law, a mean rank of 70.86 and a total rank of 7015. For geography, a mean rank of 83.20 and a total rank of 4160.

Table (7) Comparison between law and geography students in terms of environmental awareness by Mann-Whitney U test by Mann-Whitney U test

Test Statistics			
	Students' knowledge of the concepts and laws of the environment	Students' protection of the environment according to their awareness of its problems	Students' interest in environmental issues
Mann-Whitney U	2339.500	2198.500	2065.000
Wilcoxon W	7289.500	7148.500	7015.000
Z	-.546-	-1.114-	-1.658-
Asymp. Sig. (2-tailed)	.585	.265	.097
a. Grouping Variable: Student's specialization			

The table above explains the relationship between law and geography students:

- Students' knowledge of the concepts and laws of the environment: Mann-Whitney U which yielded value of 2339.5 and a significance level (Asymp. Sig.) of 0.585. Since this value is greater than 0.05, there are no statistically significant differences between law and geography students.
- Students' protection of the environment according to their awareness of its problems: Mann-Whitney U which yielded value of 2198.5 and a significance level (Asymp. Sig.) of 0.265. Since this value is greater than 0.05, there are no statistically significant differences between law and geography students. The relatively higher mean scores of Geography students compared to Law students may be attributed to several factors. Foremost among these is their exposure to a greater number of environmental-related courses, such as Environmental Geography, Environmental Problems, Environmental Legislation, Biogeography, and specialized topics in environmental studies. In addition, they are assigned research projects and environmental exhibitions as co-curricular activities, which further enhance their engagement with environmental issues.

This leads to the rejection of the second research hypothesis, which states that: There are no statistically significant differences between law and geography students according to the three axes of the study (Cognitive dimensions, Skill dimensions and Emotional dimensions).

- Students' interest in environmental issues: Mann-Whitney U which yielded value of 2065 and a significance level (Asymp. Sig.) of 0.097. Since this value is greater than 0.05, there are no statistically significant differences between law and geography students. This may be attributed not only to the environmental and environmental law courses studied by students at the university, but also to other factors that contribute to enhancing environmental awareness. These factors include social influences such as family, peers, and the broader community; various forms of media and communication channels; and civil society organizations, which promote environmental awareness through lectures, publications, and opportunities for student participation in environmental conservation and clean-up campaigns, among other activities.

Meanwhile, in the study by Widdatallah & Abdallah, 2025 the results indicated that media students have a higher level of environmental awareness and behaviors than law students.

The relationship between the axes of environmental awareness based on the

Meanwhile, in the study by Widdatallah & Abdallah (2025), the results indicated that media students have a higher level of environmental awareness and behaviors than law students. Perspectives of male and female students

Table (8) Mean rank and sum of rank of male and female

Ranks				
	Gender	N	Mean Rank	Sum of Ranks
Students' knowledge of the concepts and laws of the environment	Male	124	74.02	9178.50
	Female	25	79.86	1996.50
	Total	149		
Students' protection of the environment according to their awareness of its problems	Male	124	72.39	8976.00
	Female	25	87.96	2199.00
	Total	149		
Students' interest in environmental issues	Male	124	71.91	8916.50
	Female	25	90.34	2258.50
	Total	149		

The table above explains follow:

- For males, the sample size was 124, while for females, it was 25.
- Students' knowledge of the concepts and laws of the environment was assessed across two subjects. For males, a mean rank of 74.02 and a total rank of 9178.50. For females, a mean rank of 79.86 and a total rank of 1996.5.
- Students' protection of the environment according to their awareness of its problems was assessed across two subjects. For males, a mean rank of 72.39 and a total rank of 8976. For females, a mean rank of 87.96 and a total rank of 2199.
- Students' interest in environmental issues: was assessed across two subjects. For males, a mean rank of 71.91 and a total rank of 8916.50. For females, a mean rank of 90.34 and a total rank of 2258.50.

This finding may also be associated with gender-related differences in interests and attitudes, as previous studies have suggested that females often exhibit higher levels of concern and engagement in a variety of social and environmental issues than males (Zelezny et al., 2000).

Table (9) Comparison between male and female students in terms of environmental awareness by Mann-Whitney U test

Test Statistics ^a			
	Students' knowledge of the concepts and laws of the environment	Students' protection of the environment according to their awareness of its problems	Students' interest in environmental issues
Mann-Whitney U	1428.500	1226.000	1166.500
Wilcoxon W	9178.500	8976.000	8916.500
Z	-.618-	-1.650-	-1.959-
Asymp. Sig. (2-tailed)	.536	.099	.051

a. Grouping Variable: Gender

The table above explains the relationship between male and female students:

- Students' knowledge of the concepts and laws of the environment: Mann-Whitney U which yielded value of 1428.5 and a significance level (Asymp. Sig.) of 0.536. Since this value is greater than 0.05, there are no statistically significant differences between male and female students.
- Students' protection of the environment according to their awareness of its problems: Mann-Whitney U which yielded value of 1226 and a significance level (Asymp. Sig.) of 0.099. Since this value is greater than 0.05, there are no statistically significant differences between male and female students in terms of environmental awareness. Meanwhile, a study by Berrichi and Djafour (2025) compared environmental awareness among students according to their academic level that is, between undergraduate and postgraduate students, and concluded that there were no statistically significant differences in environmental awareness between undergraduate and postgraduate students. This validates the second research of the third research hypothesis, which states that: There are no statistically significant differences between male and female students according to the three axes of the study (Cognitive dimensions, Skill dimensions and Emotional dimensions).

- Students' interest in environmental issues: Mann-Whitney U which yielded value of 1166.5 and a significance level (Asymp. Sig.) of 0.051. Since this value is greater than 0.05, there are no statistically significant differences between male and female students.

The relatively higher mean scores of Geography students compared to Law students may be attributed to several factors. Foremost among these is their exposure to a greater number of environmental-related courses, such as Environmental Geography, Environmental Problems, Environmental Legislation, Biogeography, and specialized topics in environmental studies. In addition, they are assigned research projects and environmental exhibitions as co-curricular activities, which further enhance their engagement with environmental issues.

CONCLUSION

The results demonstrate the validity and reliability of the questionnaire in generating accurate and meaningful results. The instrument proved effective in producing valid measurements for all three dimensions cognitive, skill-based, and affective at both the individual and group levels, thereby enhancing the reliability of the results.

The analysis did not reveal any statistically significant differences across the three dimensions of environmental awareness (cognitive, skill-based, and affective). From the perspective of students in the Faculties of Law and Arts, this indicates that students in both faculties share similar views on promoting environmental awareness among themselves both on and off campus, and that the three dimensions are equally important to them.

Similarly, no statistically significant differences were found between law school students and college of arts (geography students across the study's three dimensions-cognitive, skill-based, and emotional-based on their responses, which reinforces the similarity in how students from both colleges perceive the importance of the environment and its conservation, regardless of the dimensions.

Furthermore, the results indicated no statistically significant differences between genders (male and female) in their responses across the cognitive, skill-based, and emotional dimensions; this finding confirms that environmental awareness among students in the College of Law and the College of Arts (Geography does not depend on gender.

This study recommends highlighting the role of King Faisal University in developing educational training programs to raise student's awareness of environmental conservation both on and off campus, as well as the need to involve local communities in these educational programs.

References

1. Ahmad, J., Mahmood, Q., & Khan, I. (2020). Environmental awareness, concern, attitude and behavior of university students: A comparison across academic disciplines. *Polish Journal of Environmental Studies*, 29(6), 4487-4496. doi.org
2. Ahmet Semih Uzundumlu, Büşra Çakmur, Nur Ertek Tosun, 2025, Determinants of Environmental Pollution Awareness Among University Students: A Case Study of Atatürk University, *Turkish Journal of Agricultural and Natural Sciences* 12 (2): 501–509, <https://doi.org/10.30910/turkjans.1638305>
3. Aldosari, M.S. (2026), *Acritical review of environmental sustainability policies in light of Saudi Arabia's Vision* . <https://doi.org/10.58256/2qh6kx59>
4. Al-Naeem, M. A. (2020). Level of sustainability awareness among university students: A case study in Saudi Arabia. *Sustainability*, 12(8), 3159. doi.org
5. Anna Mravcová 2019; ENVIRONMENTAL AWARENESS AND ENVIRONMENTAL CITIZENSHIP DIMENSION, *Slovak Journal of Political Sciences*, Volume 19, No. 2, Pages:32-48, DOI: <https://doi.org/10.34135/sjps.190202>
6. Berrichi M., Djafour R. (2025). The level of environmental awareness among female university students. *Science, Education and Innovations in the Context of Modern Problems*, 8(9), 730–741. <https://doi.org/10.56352/sei/8.9.64>
7. Berrio-Quispe ML, Chávez-Bellido DE, Aguilar-Mori K, 2023. Conciencia ambiental y hábitos de consumo en estudiantes universitarios. *Salud, Ciencia y Tecnología - Serie de Conferencias 2023*; 2:570. <https://doi.org/10.56294/sctconf2023570>
8. DARHL M. PEDERSEN 1999; DIMENSIONS OF ENVIRONMENTAL COMPETENCE, *Journal of Environmental Psychology*, Volume 19, Issue 3, Pages 303-308, <https://doi.org/10.1006/jevp.1999.0130>
9. Edgar Octavio Roque Huanca, Maribel Mamani Roque, Heber Nehemias Chui Betancur,. 2025, Environmental awareness and environmental health among university students, *International Journal of Innovative Research and Scientific Studies*, 8(12) , pages: 369-374, DOI: 10.53894/ijirss.v8i12.11105
10. Hegazy, Ibrahim (2024), Strategic environmental assessment for sustainable coastal zone management in Sudia Arabia, aligning with Vison 2030, *Journal of Um Al- Qura University for Engineering and Agriculture*, 15, 624-636. <https://doi.org/10.1007/s43995-024-00081-1>
11. Ihtisham Ul Haq, Muhammad Nisar, Khurram Shahzad.; 2025. Analysis of Environmental Awareness Among University Students Through Online Community Participation. *Social Science Review Archives*, 3(2), 842–852. <https://doi.org/10.70670/sra.v3i2.675>
12. Jonathan J. Shuster, Myron N. Chang & Lili Tian (2004) Design of Group Sequential Clinical Trials with Ordinal Categorical Data Based on the Mann–Whitney–Wilcoxon Test, *Sequential Analysis*, 23:3, 413-426, DOI: 10.1081/SQA-200027053 To link to this article: <https://doi.org/10.1081/SQA-200027053>
13. King Faisal University Conference Services. (2021). Second International Conference on Food Security and Environmental Sustainability. <https://services.kfu.edu.sa/fsescon>
14. Lelwala, E.I., Samarasinghe, W.M., and Gunarathna, K.M.L.M. (2024), Nonparametric Approach to Detecting Seasonality in Time Series: Application of the Kruskal-Wallis (KW) Test on Tourist Arrivals to Sri Lanka, *South Asian Journal of Business Insights*, 2024,4(1) 03-19, DOI: <https://doi.org/10.4038/sajbi.v4i1.61>

15. Mujeeb Abd, Baneen (2024), Kruskal-Wallis –Testm, A graduation research submitted to the council Department of Mathematics in the college of Education for pure sciences/ University of Babylon, as part of the requirements obtaining a bachelor's degree in mathematics, https://cdnx.uobabylon.edu.iq/undergrad_projs/MZP69S70CUIIdjnStVYbYaQ.pdf
16. Musab Abdelgadir Widdatallah, Mohammed Elsadig Abdallah 2025; Impact of Media Exposure on Environmental Legal Literacy and-Pro Environmental Behaviors Among University Students, *Studies in Media and Communication*, Vol. 14, No. 1, Pages 103-111, <https://doi.org/10.11114/smc.v14i1.8026>
17. Nowak. Claus P, Mutze. Tobais, Koniettschke. Frank 2022, Group sequential methods for the mann-Whitney parameter, *Statistical Methods in Medical Research*, Vol. 31(10) 2004–2020, DOI: 10.1177/09622802221107103
18. Park Y. (2025) Optimal two-stage group sequential designs based on Mann-Whitney-Wilcoxon test. *PLoS ONE* 20(2): e0318211. <https://doi.org/10.1371/journal.pone.0318211>
19. Princess Nourah University. (2021). News and Activities: Environmental Awareness Campaigns. <https://pnu.edu.sa/ar/NewsActivities/Pages/news3086.aspx>
20. Sherwani, R.A. K, Shakeel, H. , Awan. W.B, Aslam, M. (2021), Analysis of COVID-19 data using neuromorphic Kruskal Wallis H test, *BMC Medical Research Methodology*, (2021) 21:215 , <https://doi.org/10.1186/s12874-021-01410-x>
21. SPA. (2017, March 13). Workshop Discusses the Role of the Academic Sector in the National Environmental Strategy. <https://www.spa.gov.sa/1635384>
22. Zelezny, L. C., Chua, P.-P., & Aldrich, C. (2000). *New ways of thinking about environmentalism: Elaborating on gender differences in environmentalism*. *Journal of Social Issues*, 56(3), 443–457. <https://doi.org/10.1111/0022-4537.00177>