RESEARCH ARTICLE

The level of environmental awareness among female university students

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Abstract

The current study aimed to explore the level of environmental awareness across its various dimensions among female university students and to examine differences based on academic level and educational stage. Using a descriptive methodology that combined both exploratory and comparative approaches, the researchers administered an Environmental Awareness Questionnaire to a sample of 135 female students. The data were analyzed using statistical tools including the arithmetic mean, one-way ANOVA, and the independent samples t-test. The findings led to the following conclusions:

- The level of environmental awareness across its dimensions among the study sample is high.
- There are significant differences in environmental awareness between second-year undergraduate students and first-year Master's students.
- No significant differences in environmental awareness were found based on the academic stage (Bachelor/Master).

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1. Introduction

Environmental psychology is currently receiving increasing attention alongside various environmental issues, as humans have significantly distanced themselves from nature, often causing it considerable harm even if they are aware of it, they continue to deny it. Interest in a healthy and safe environment first emerged during the Environmental Conference held in Rio de Janeiro, Brazil, in 1992, where more than 165 countries signed a declaration document known as *Agenda 21* for the safety of humanity during the 21st century (Al-Rifai, 2009, p. 254). Accordingly, environmental awareness, as a concept, aims to build a positive citizen who is aware of environmental issues, to develop an understanding of their importance, to foster social values, and to study and analyze environmental problems from a value-based perspective while developing the necessary skills to comprehend and appreciate the relationship between humans and their environment (Alyan, Bousmaha & Shami, 2014, p. 14). Experts have found that the idea of environmental protection and resource conservation alone is not sufficient to solve environmental problems; therefore, education was employed to help solve and mitigate these issues (Al-Zoubi, 2015, p. 821). *Zint* also stated that the necessity of protecting the environment does not lie

solely in the enforcement of law but in the implementation of environmental education, which raises environmental awareness by addressing the intellect (Brek & Qaidum, 2018, p. 173).

Accordingly, the concepts of environmental awareness and environmental education emerged to enlighten individuals about environmental concepts as the most effective means of placing people before their full responsibilities in dealing with environmental issues. Salim (1999) recommended the need to spread environmental awareness through awareness programs targeting youth, especially students, to modify their attitudes and behaviors toward environmental issues. Abdel Salam (1991) emphasized the importance of promoting their environmental culture and enhancing appropriate knowledge and attitudes towards environmental issues, along with scientific thinking skills to prepare them for life as citizens capable of identifying and addressing existing environmental problems and interacting with the environment responsibly. In this regard, the study by Al-Muafa (2020) showed that the level of environmental awareness among students at Najran University was weak, and recommended strengthening the university's efforts in environmental education, especially among non-scientific majors and early academic levels.

Furthermore, global environmental experts and specialists have indicated that solving the environmental crisis requires deeply rooted environmental awareness within the education system at all levels. One of the best ways to preserve the environment is by raising environmental awareness in society, particularly among students, as they are the future leaders, guardians, planners, and policymakers (Agarwal, 2013, p. 50). Similarly, Singh's (2013) study confirmed that environmental awareness has become one of the primary goals of sound environmental education pursued by research centers, conferences, and symposia, in recognition of its importance in improving environmental awareness. Feminist research has also extended into environmental issues, giving rise to the movement of *ecofeminism*, reflecting the intersection of feminist and environmental goals. Rosemary Radford Ruether wrote in her book *New Woman/New Earth* that women must recognize there will be no liberation for them or resolution of the environmental crisis in a society where the basic model of relationships is based on domination. She urged the unification of feminist and environmental demands to propose a radical restructuring of social and economic relationships and the underlying values of modern industrial society (Jafal & Belkhiri, 2020, p. 111).

In light of the importance of environmental awareness, it aims not only to provide information but also to change individual behavior and decision-making processes. Cooperation and persuasion are essential, and environmental psychology tends toward applying laws that foster behavioral habits derived from experimental psychology in modifying attitudes toward the environment. Accordingly, the educational component is crucial for fostering behaviors that respect environmental laws and legislation, as well as encouraging participation in their development. Human awareness must emerge from critical education and ethics that guide individuals toward a comprehensive understanding of environmental issues (Abdulrahman & Ibrahim, 2020, p. 422).

1.1. Problem Statement

Environmental problems are, first and foremost, a deviation in human behavior. Therefore, addressing them must originate from the individual themself, as legislation, laws, and even scientific and technological research alone are no longer sufficient to limit them unless accompanied by individual awareness and understanding of the value of preserving a clean and healthy environment. This awareness depends on the extent of accurate environmental knowledge possessed by the individual (Al-Saqqaf, 2018, p. 5). Numerous studies, such as that of Kamel (2002), have pointed to the low level of environmental awareness among university students, which necessitates the dissemination of environmental culture and efforts to raise their level of environmental awareness. Similarly, the study by Al-Hasnawi and Al-Mawla (2020) emphasized the need to change students' attitudes and opinions toward many important environmental issues, in order to make them positive citizens in society and to promote and develop several positive traits in their personalities, including environmental awareness, through the provision of various purposeful information (Hussein & Al-Naqeeb, 2023, p. 161).

Early studies in the field, such as that of Al-Halabi (1997), suggested that confronting environmental pollution problems requires a change in individuals' behaviors to mitigate their severity and risks. Sabri (1998) even stressed that youth possess the opportunity to create the appropriate change for preserving and protecting the environment, especially as their societal role grows. Inadequate handling of environmental problems is often due to a lack of environmental awareness among individuals. Therefore, environmental awareness must be promoted within families, schools, and universities in particular. The study by Al-Mawla (2009) confirmed the importance of enhancing environmental awareness specifically

among university students, as they are among the most influential groups in society. This can be achieved through academic programs, curricula, and extracurricular activities such as projects and educational exhibitions, with the aim of activating students' roles in environmental protection by raising their level of environmental awareness (Hussein & Al-Naqeeb, 2023, pp. 157–158).

While education plays a fundamental role in promoting environmental awareness, the university holds a distinct role. Some universities around the world including in Algeria have taken initiatives to serve the environment as part of addressing the contemporary environmental crisis in their communities. This approach to education aims to develop students' understanding of environmental characteristics, concepts, modes of thinking, attitudes, and values regarding various environmental issues. In a related context, the study by Mutlaq (2008), conducted on negative or improper behavioral phenomena and their prevalence among students in the Faculty of Humanities at Koya University in Iraq, found that 64% of students exhibited negative behaviors. Meanwhile, the studies by Raeed and Munshid (2014), as well as Kuru & Palmberg (2005), indicated varying levels of awareness among female students. Their results also showed that students in scientific disciplines had better levels of knowledge than those in humanities disciplines (Bani Melhem, Bani Said & Al-Lubani, 2017, pp. 8–9). The study recommended the need to focus on environmental education at all educational levels. Additionally, the findings of the study by Saqqar (2007) revealed statistically significant differences at the level of significance ($\alpha \geq 0.05$) in the average performance of students at Mu'tah University on the Environmental Awareness Scale based on gender, with the differences favoring females.

Based on the above and given the scarcity of previous studies, to the researchers' knowledge, on measuring the level of environmental awareness among female university students in the local context and with the researchers' desire to contribute scientifically to the topic, the need arose to study this phenomenon.

1.2. Research Questions:

- What is the level of environmental awareness across its dimensions among the study sample?
- Are there differences in the level of environmental awareness among the study sample attributable to academic level?
- Are there differences in the level of environmental awareness among the study sample attributable to educational stage?

1.3. Research Hypotheses:

- The level of environmental awareness across its dimensions among the study sample is low.
- There are no differences in the level of environmental awareness among the study sample attributable to academic level.
- There are no differences in the level of environmental awareness among the study sample attributable to educational stage.

1.4. Objectives of the Study:

The present study aims to answer its questions through:

- Identifying the level of environmental awareness among the study sample.
- Testing differences in the level of environmental awareness among the study sample according to academic level and educational stage.

1.5. Significance of the Study:

The importance of studying environmental awareness lies in identifying any potential deficiencies and gaining insight into them, and then working to change incorrect ideas, behaviors, and negative emotions through future targeted programs that meet the needs of the intended group and encourage opportunities for effective community participation to acquire positive behavior toward the environment.

1.6. Operational Definition:

Environmental Awareness:

It refers to all the ideas, beliefs, feelings, and behaviors held or expressed by the female university student the study sample that reflect her concern and knowledge about all environmental matters, summarized as: awareness of environmental knowledge, sensitivity to environmental problems, and possession of tools or ideas that contribute to solving these problems. This is measured through the Environmental Awareness Scale developed by Jaafour and Brichi (2018).

1.7. Study Delimitations:

- **Spatial delimitation:** Faculty of Humanities and Social Sciences – University of Ouargla.
- **Human delimitation:** Female university students.
- **Temporal delimitation:** April – May 2025.
- **Topical delimitation:** The study results are defined by the use of the Environmental Awareness Scale developed by the researchers.

2. Methodology and Instruments

2.1. Research Method:

In accordance with the objectives of the current study, a descriptive method was adopted, employing both exploratory and comparative approaches.

2.2. Population and Sample:

The study population consisted of all female students in the Faculty of Humanities and Social Sciences, including first-year students in the field of Social Sciences, second-year students in Psychology, and Master's level students in Psychology and Educational Sciences. A sample of 135 female students was selected, distributed as follows: 65 first-year Social Sciences students, 32 second-year Psychology students, 19 first-year Master's students, and 19 second-year Master's students, for the academic year 2024/2025.

2.3. Study Instrument:

The Environmental Awareness Scale was developed by the researchers and applied in its final form, consisting of 32 items, after assessing its applicability through the estimation of its psychometric properties.

Psychometric Properties

Validity: Several methods were used to verify the validity of the instrument, as follows:

- **Expert Validity:** The initial version of the scale, consisting of **83 items**, was submitted to a group of ***5* academic experts** from Kasdi Merbah University – Ouargla, to review the linguistic clarity and relevance of the items to the subject. Based on their feedback, **1 item** was removed, reducing the total to **82 items**, and several items were reworded.
- **Internal Consistency:** By applying the 82-item version of the scale to a **pilot sample** of **61 individuals**, significant correlations were found between most items and the total score, except for **27 items** (items 1, 2, 7, 13, 16, 18, 22, 25, 29, 37, 38, 41, 43, 44, 45, 46, 47, 52, 56, 58, 61, 62, 64, 70, 71, 77, 78), where the **p-value was greater than 0.05**, leading to their removal.
- **Discriminative Validity of Items:** The **27% rule** was applied to define the upper and lower groups, with each group consisting of **16 individuals**. Using the **t-test** to assess the significance of differences between the two groups

for the remaining **55 items**, **5 items** (items 08, 10, 30, 51, 68) were found not to significantly differentiate between the groups (**$p > 0.05$**) and were thus removed. The scale was consequently reduced to **50 items**.

- **Factor Analysis:** Results of the factor analysis revealed that **32 items** loaded significantly onto the scale, identifying **three main factors** as follows:
    - **Factor 1: Awareness of Environmental Problems** – consisting of **16 items** (1, 2, 5, 6, 9, 10, 13, 14, 17, 18, 21, 22, 25, 26, 29).
    - **Factor 2: Environmental Knowledge** – consisting of **8 items** (3, 7, 11, 15, 19, 23, 27, 31).
    - **Factor 3: Contribution to Environmental Protection** – consisting of **9 items** (4, 8, 12, 16, 20, 20, 4, 08, 32). *(Note: some item numbers appear repeated – this may require verification.)*
- **Reliability:** After confirming the scale's validity, its reliability was assessed using **Cronbach's Alpha**, which yielded a coefficient of **.88**.

The scale used a **five-point Likert scale** (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree), with **5** as the highest and **1** as the lowest score. The results were interpreted using the following criteria:

- **1.00 – 1.80:** Very Low
- **1.81 – 2.60:** Low
- **2.61 – 3.40:** Moderate
- **3.41 – 4.20:** High
- **4.21 – 5.00:** Very High

2.4. Statistical Methods:

To test the study hypotheses, the following statistical methods were used:

- **Arithmetic mean and standard deviation** were used to test the validity of the first hypothesis.
- **One-way ANOVA** was used to test the validity of the second hypothesis.
- **Independent samples t-test** was used to test the validity of the third hypothesis.

3. Results and Discussion

3.1. Presentation and Discussion of the First Hypothesis Results:

The first hypothesis states the following: **"The level of environmental awareness in its dimensions among the study sample is low."**

To test the validity of this hypothesis, the **weighted arithmetic mean** and **relative weight** were used. The results are presented in **Table (1).**

Table (1): Weighted Arithmetic Mean and Relative Weight of the Level of Environmental Awareness in Its Dimensions Among the Study Sample

N = 135	Weighted Arithmetic Mean	Level Judgment	Standard Deviation (SD)	Relative Weight (%)
Awareness of Environmental Problems	4,06	High	0,44	81.2

Knowledge of Environmental Concepts	4,00	High	0,55	80
Contribution to Environmental Protection	3,70	High	0,60	74
Environmental Awareness	3,92	High	0,44	78.4

(Source: Prepared by the researchers based on SPSS outputs)

It is evident from Table (1) that the arithmetic means of the dimensions of the environmental awareness scale ranged between **3.70 and 24.06**, with a standard deviation ranging between **0.44 and 0.60**. All the aforementioned means fall within the high level of awareness. The overall arithmetic mean of environmental awareness was estimated at **3.92**, which also falls within the high level. In terms of the order of relative weight percentages of the dimensions, they are ranked as follows: **awareness of environmental problems, knowledge of environmental concepts, and contribution to environmental protection**.

The results of the statistical analysis indicated that environmental awareness, in its three dimensions (awareness of environmental problems, knowledge of environmental concepts, and contribution to environmental protection), is high among the study sample.

The results of the current study differ from those of several previous studies, including that of Kamel (2020) on environmental awareness among female students at Shaqra University, which showed a low level of environmental awareness. Similarly, the study by Al-Tarawneh (2018) on the level of environmental awareness among students of the Faculty of Arts at Al-Zaytoonah University of Jordan found that the overall level of environmental awareness was moderate. The cognitive component ranked first (with a high level), followed by the emotional component (with a moderate level), and finally the skill-based component (also with a moderate level).

The study by Al-Shadaydeh and Oreibat (2016) on the prevailing level of environmental awareness among women in the local community of the Deir Alla district and its relation to personal, economic, and social characteristics indicated that 74% were at a moderate level.

Additionally, the study by Mohammed and Khalaf (2013) on university students' awareness of the dangers of chemical pollutants found a low level of environmental awareness. Likewise, the study by Al-Mawla (2009) on environmental awareness among students of the Faculty of Education across its departments revealed a generally low level of environmental awareness.

Similarly, Al-Badrani's (2004) study pointed to a low level of overall environmental awareness among students of the Department of Life Sciences in the Faculty of Education at the University of Mosul. The study by Al-Babtain (2002) on the level of environmental awareness regarding certain environmental risks among female students of the scientific departments at the College of Education in the cities of Mecca and Jeddah also showed that their level of environmental awareness was moderate.

The current study is consistent with the findings of Al-Furaih (2021) regarding the level of environmental awareness among female students at Imam Muhammad bin Saud Islamic University, which showed that the students had sufficient environmental awareness. It also aligns with the study by Zerouali (2021) on the level of environmental awareness among students at the University of Oum El Bouaghi, which reported a high level of awareness (Ali, 2024, p. 4). One of the key findings of the study by Qian et al. (2016) was a high awareness rate (concerning air and ocean pollution and health) among women, reaching 64.5%.

Similarly, the study by Saqqa and Samaan (2015) on the level of awareness among female students at the College of Education, Yanbu branch of Taibah University, concerning environmental concepts and related issues, indicated that the study sample had environmental awareness. Furthermore, the study by Al-Zoubi (2015) on the level of environmental

awareness among students of the Faculty of Educational Sciences at the World Islamic Sciences and Education University showed that students had a high level of environmental awareness, with a percentage of 77.5%.

Abdul Rahman's (2013) study on environmental awareness among a sample of students at the University of Koya and its relation to the quality of environmental content in the curriculum and other variables also indicated that the sample had an above-average level of environmental awareness.

Accordingly, the findings of the current study can be interpreted as follows:

Previous literature and studies confirm that environmental awareness encompasses several dimensions, as the relationship between humans and the natural environment represents a practical expression of an ethical system and the application of values and beliefs. The study sample showed a clear interest in the environment, as the university student considers environmental knowledge and behaviors a necessary commitment. This interest drives continuous engagement with environmental topics, always seeking the latest updates, implying repeated exposure to various sources that promote environmental awareness, such as religious culture, certain university courses, and diverse media outlets.

Several studies, including those by Chhal & Kaur (2018) and Rahim & Jalalludin (2016), have confirmed the significant role that social media platforms play in spreading environmental awareness, due to their accessibility, speed of information dissemination, and the presence of dedicated platforms for environmental education. Additionally, environmental issues and problems surrounding students and their interest in such topics make them eager to acquire information related to public health and follow environmental news closely.

The study by Sinha & Ali (2013) emphasized that environmental awareness is the first step in shaping pro-environmental behavior.

2.3. Presentation and Discussion of the Results of the Second Hypothesis:

The second hypothesis states the following: "There are no differences in the level of environmental awareness among the study sample that can be attributed to the academic level."

To test the validity of this hypothesis, a one-way ANOVA was conducted. The results are presented in Table (2):

Table (2): F-value and its statistical significance

Source of Variance	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	Calculated F-value	p-value (Sig.)
Between Groups	2070,213	3	690,071	3,822	,012
Within Groups	23649,520	131	180,531		
Total	25719,733	134			

It is noted from Table (2) that the p-value is 0.012, which is less than the significance level of 0.05. Therefore, at least two means are not equal. To identify the source of the difference, post hoc comparisons were used, and they showed a statistically significant difference between second-year students and first-year Master's students, with a p-value of 0.026 and a mean difference of 11.30, while no significant differences were found between the other groups.

This result can possibly be explained by the fact that second-year students have not yet taken courses specifically related to environmental education. The study by Jasim, Al-Najdi, and others emphasized the importance of including environmental courses within university curricula to raise students' awareness of environmental issues and problems. It also stressed the importance of students attending such courses to enhance their level of awareness and develop positive attitudes toward the environment. Similarly, the study by Al-Damour confirmed the impact of curricular and extracurricular programs on the degree of environmental awareness (Al-Najjar, 2021, p. 84).

The study by Al-Badrani (2004) on the level of environmental awareness among students of the Life Sciences Department at the College of Education, University of Mosul, also pointed to differences according to the academic level variable (Al-Saqqaf, 2018, p. 8). Ziyadat's (2010) study indicated that environmental awareness among university students increases linearly from the first to the fifth year. The educational level of the participants played an important role in the degree of environmental awareness in all the cities and villages included in the survey.

Likewise, the study by Al-Adaili and Al-Harashah (2013) revealed differences in students' attitudes toward some issues related to environmental safety in favor of those who had taken a course in environmental education. The study by Omran and Miftah (2020) also confirmed the importance of the cognitive, emotional, and skill-based goals of environmental education in developing environmental awareness among students at the University of Sidra Gulf, from the perspective of faculty members (Ali, 2024, p. 4).

Singer (2013), for his part, pointed out that the growing concern for the environment and its problems has led many countries around the world to adopt programs and curricula that ensure the effectiveness of environmental education in schools, universities, and institutes. He advocates for the necessity of incorporating environmental education courses properly into university curricula to firmly establish environmental concepts in students' minds and develop their awareness.

Since environmental education is a continuous process, it is essential that it be introduced progressively starting from the first year until graduation, rather than being limited to a specific academic level (currently the third year). The observed difference is an indication that the courses introduced later may have changed the students' perception of the topic. Hussein (2002) argues that the components of environmental awareness must be linked to environmental education, cultural context, and environmental media.

3.3. Presentation and Discussion of the Results of the Third Hypothesis:

The third hypothesis states the following: "There are no differences in the level of environmental awareness among the study sample that can be attributed to the educational stage."

To test the validity of this hypothesis, a one-way ANOVA was conducted. The results are presented in Table (3):

Table (3): t-value and its statistical significance on the environmental awareness scale according to the variable of educational stage

Indicators	N	M (Mean)	SD	df	t-value	p-value (Sig.)	Sig
Bachelor's	97	127.16	14.03	133	0.60	0.54	0.05
Master's	38	125.55	13.48				

(Source: Prepared by the researcher based on SPSS outputs)

Table (3) shows that the t-value reached 0.60 at a degree of freedom of 133, and it is noted that the p-value (sig) = 0.54, which is greater than the significance level of 0.05. Accordingly, there are no significant differences in environmental awareness among the study sample that can be attributed to the educational stage.

The results of the statistical analysis for the third hypothesis indicate that there are no statistically significant differences in environmental awareness based on the educational stage. This can be interpreted as follows:

The widespread awareness among the students reflects the seriousness of the environmental situation, which has prompted them to take an interest in and follow up on the issue. Moreover, it indicates a clear tendency among the students to adopt a mindset of environmental preservation and knowledge, and to seek solutions to environmental problems viewing this as a personal responsibility, rather than one that falls solely on the state or its institutions. Achieving environmental security requires the participation of all parties, regardless of their level or responsibility.

Additionally, environmental education may be received either formally (through academic curricula) or informally (via various media and social sources). Hilmi's (1998) study indicated that women acquire their knowledge of environmental issues from diverse sources such as newspapers and magazines, radio and television, and textbooks, highlighting the variety of information sources.

Studies by Vandrick (2011), Qian et al., and Rahim & Jalalludin on the role of the internet in environmental awareness have shown that it has become an effective tool for spreading information, raising public awareness about environmental issues, and promoting active engagement much like television and print media. It also encourages free exchange of ideas, participation, and change (Al-Najjar, 2021).

The current result can also be interpreted to mean that interest in the environment is a value for the university student, not merely an optional matter. This implies that students implicitly adopt the concept of environmental citizenship, which includes awareness of both individual and collective responsibility toward the environment. Students may also participate in community-based environmental activities (such as tree planting campaigns, educational trips, and site visits).

The study by Jadhav & Raut (2014) concluded that learning outside the university provides opportunities to develop environmental awareness and responsibility, which in turn enhances environmental attitudes and responsible behavior (Al-Najjar, 2021). This suggests that the information sources for students in both educational stages are similar, which minimizes differences in the quantity and quality of knowledge and experience acquired, since both exert a similar influence on students at either stage.

4. Conclusion

Given that the female university student is a key figure in society (within the family, university, workplace, associations, community activities...), and has the potential to effect change through her ideas and attitudes and in light of the scarcity of studies on this specific topic the current study aimed to explore the level of environmental awareness among female university students and examine differences based on academic level and educational stage. The results revealed the following:

- The level of environmental awareness among female university students is high.
- There are differences in environmental awareness between second-year Bachelor's students and first-year Master's students.
- There are no differences in environmental awareness based on the educational stage.

These results confirm the high level of awareness among students regarding various environmental issues and their eagerness to be active participants in addressing them. This awareness can be further enhanced through the implementation of the following proposals:

- Develop academic courses across all levels that are sufficient to spread environmental awareness among all students.
- Conduct scientific studies that highlight the consequences of the current environmental situation and encourage a renewed interest in nature.
- Encourage voluntary participation in university-led environmental campaigns and activities.
- Provide opportunities for students to create innovative projects related to environmental care and awareness.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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