

## Research Article

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## Exploring Attitudes Toward Environmental Conservation Among University Students in the Peruvian Amazon: A Cross-Sectional Study

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**Abstract**

**Background/purpose.** Attitudes toward environmental conservation have become a key factor in addressing global ecological challenges. Positive environmental attitudes play a crucial role in adopting sustainable practices. This study aimed to assess the attitudes of university students from the Peruvian Amazon toward environmental conservation.

**Materials/methods.** A quantitative, non-experimental, descriptive, and cross-sectional study was conducted with a sample of 588 male and female university students. Participants responded to an Ad Hoc questionnaire designed to evaluate attitudes toward environmental conservation, which demonstrated adequate internal consistency.

**Results.** Most participants reported a very favorable (46.9%) or favorable (36.1%) attitude toward environmental conservation, while a smaller percentage showed an indifferent (11.9%), very unfavorable (2.7%), or unfavorable (2.4%) attitude. Regarding the dimensions, the cognitive aspect reflected the highest proportion of very favorable responses (61.9%), followed by the affective (50.3%) and behavioral (32.5%) dimensions. However, the behavioral dimension also showed a higher proportion of indifferent responses (16.3%). Statistically significant differences were found in attitudes toward environmental conservation according to the year of study.

**Conclusion.** University students from the Peruvian Amazon exhibit generally positive attitudes toward environmental conservation, particularly in the cognitive and affective dimensions. Nevertheless, a gap is evident in the behavioral dimension, as these attitudes do not always translate into concrete actions.

## 1. Introduction

Environmental impact has become one of the most significant challenges of the 21st century. The acceleration of climate change and the degradation of ecosystems represent a growing threat to biodiversity and human health worldwide. Human activities, such as the overexploitation of natural resources, uncontrolled industrialization, and widespread pollution, have contributed to the deterioration of natural environments. This scenario highlights the urgent need to address the relationship between human activity and the environment in order to mitigate its long-term effects.

The current global environmental crisis is generating increasing concern due to the adverse effects of pollution on ecosystems and human health (Shetty et al., 2023). Environmental pollution, resulting from industrial activities, excessive resource consumption, and the overproduction of waste, has led to significant deterioration of the natural environment, compromising biodiversity and the quality of life of populations (Moghim et al., 2024). Factors such as deforestation, water and air pollution, indiscriminate use of plastics, and greenhouse gas emissions have intensified climate change, triggering extreme phenomena such as heatwaves, floods, and prolonged droughts (Tafur et al., 2024; Kaur & Pandey, 2021).

In the Peruvian region of Madre de Dios, where this study was conducted, the environmental situation is also alarming and continues to worsen. Despite being recognized as the “Biodiversity Capital of Peru” due to its extraordinary richness in flora and fauna and its vast protected natural areas, the region faces serious environmental and social issues that threaten its ecosystem (Estrada et al., 2023). The most critical problems include alluvial gold mining, which contaminates rivers and soils with mercury, indiscriminate logging that accelerates deforestation, poaching and trafficking of endangered species, and inefficient solid waste management (Brack et al., 2011). These issues not only disrupt the ecological balance of the region but also affect the health and well-being of the local population, exposing them to environmental risks and the gradual loss of the natural resources that sustain their economy and way of life (Hariram et al., 2023).

In this context, environmental education and the development of responsible attitudes toward the environment are fundamental to mitigating the impact of these problems (Van de Wetering et al., 2022). Universities, as institutions that train professionals and critical citizens, play a strategic role in raising awareness among the student community—not only by providing knowledge about sustainability but also by fostering values and skills that drive behavioral change. Through curricular and extracurricular programs, these institutions can become key agents in promoting ecological practices, encouraging participation in environmental initiatives, and consolidating a university culture focused on respect and care for the natural environment (Alsayrayreh, 2025).

The attitude of university students toward environmental conservation is a key factor in promoting sustainable behaviors and reducing environmental impact. Understanding their cognitive perceptions, emotional responses, and behavioral dispositions helps identify the factors influencing their commitment to environmental protection. Moreover, as university students represent a strategic group for driving social change, assessing their attitudes provides relevant information for designing educational programs and awareness campaigns. Therefore, this study aims to contribute to developing strategies that foster greater ecological responsibility within the university community and, by extension, in society.

Therefore, the aim of this research was to assess the attitude of university students from the Peruvian Amazon towards environmental conservation. To this end, the following general research question is posed: What is the attitude of university students from the Peruvian Amazon towards environmental conservation? Based on this general question, the following specific questions are derived: (a) How do university students from the Peruvian Amazon perceive the cognitive, affective, and behavioral dimensions related to environmental conservation? (b) To what extent is the general

attitude of university students from the Peruvian Amazon towards environmental conservation associated with sociodemographic variables such as sex, age, field of study, year of study, and students' origin?

## 2. Literature review

Environmental attitude toward conservation is defined as an individual's psychological predisposition to value, support, and engage in actions aimed at protecting and sustainably using natural resources (Casa et al., 2019). This attitude involves cognitive, affective, and behavioral aspects, which determine how individuals understand, feel, and commit to environmental preservation (Farfán et al., 2024). Moreover, attitude is not a static construct; it develops and transforms over time through education, experience, and interaction with one's environment (Vásquez, 2018).

The components of environmental conservation attitude include cognitive, affective, and behavioral dimensions (Mamani et al., 2020). The cognitive component refers to the knowledge and ideas a person holds regarding environmental conservation, including the importance of preserving ecosystems, sustainability strategies, and the impact of human actions on the natural balance (Bucht et al., 2024). The affective component encompasses the emotions and feelings evoked by environmental conservation, such as empathy toward nature, concern for its degradation, or a sense of ecological responsibility (Chumbe, 2021). Lastly, the behavioral component relates to individuals' disposition and concrete actions to actively contribute to environmental conservation, such as reducing resource consumption, using renewable energy, and participating in environmental education programs (García et al., 2023).

Several theories have been proposed to understand the development of these attitudes. The Theory of Planned Behavior (Ajzen, 1991) explains how attitude, subjective norm, and perceived control influence the intention to act pro-environmentally. Likewise, Social Learning Theory (Bandura, 1977) emphasizes the role of observation and imitation in acquiring ecological behaviors, while the Value-Belief-Norm Model (Stern, 2000) highlights the importance of personal values and environmental awareness in forming individual norms that guide sustainable conduct. These theories help explain, understand, and promote favorable environmental attitudes in university communities.

Various factors influence the formation of environmental conservation attitudes, including individual, social, and contextual elements (Gifford & Nilsson, 2014). Environmental knowledge, ecological sensitivity, and personal experiences with nature stand out among individual factors. People who are more informed about environmental problems and their consequences tend to develop stronger ecological awareness and a greater predisposition to act in favor of sustainability (Bogarin, 2023). The influence of family, peers, and society is key at the social level, as the norms and values transmitted within these environments can either reinforce or weaken pro-environmental behaviors (Collado et al., 2017). Contextual factors such as environmental policies, access to ecological education programs, and urban infrastructure for waste management and renewable energy use also play a decisive role in shaping favorable attitudes toward environmental conservation (Pham et al., 2024).

As institutions that train future generations, universities play a fundamental role in promoting pro-environmental attitudes among students (Mohammadi et al., 2023). To achieve this, they must implement a variety of strategies and programs aimed at raising awareness and educating young people about the importance of environmental protection (Esteban et al., 2020). These include the integration of environmental topics into curricula—enabling students to understand environmental issues from an academic perspective (Estrada, 2024)—as well as awareness and recycling campaigns that encourage active student participation in sustainable practices (Uzorka et al., 2024). Additionally, promoting university social responsibility invites students to engage directly with their environment

(Velásquez & Estrada, 2023). By implementing these measures, institutions not only enhance knowledge of environmental problems but also help modify students’ attitudes and behaviors, guiding them toward greater ecological awareness and a pro-environmental stance on pollution.

Several studies have examined university students' attitudes toward environmental conservation. For example, Noguera (2023) found that Guatemalan students showed a strong interest in environmental conservation, indicating a positive predisposition toward pro-environmental practices. Similarly, Calderón and Camarena (2022) found that the majority of Panamanian students strongly agreed (61%) with environmental protection, particularly in the emotional (68%), behavioral (63%), and cognitive (57%) components of their pro-environmental attitude. Meanwhile, Şahin and Erkal (2017) concluded that Turkish university students generally had a positive attitude toward environmental protection. These findings show a common trend across regions, with university students displaying favorable attitudes and growing commitment to environmental conservation.

3. Methodology

3.1. Research model

This study adopted a quantitative approach aimed at collecting numerical data to identify behavioral patterns within the analyzed sample. A non-experimental design was used, as the variable under study was not deliberately manipulated but rather observed in the participants' natural environment. The research was descriptive and cross-sectional, as it focused on examining the characteristics of the variable at a single point in time.

3.2. Context and participants

The population consisted of all students enrolled in the 2024-II academic term at a public university in the Peruvian Amazon. A total of 588 students participated in the study, selected through probabilistic sampling with a confidence level of 95% and a significance level of 5%. As shown in Table 1, most participants were male students aged 16 to 20, primarily from the engineering field and the jungle region in their first year of studies.

Table 1. Sociodemographic and Academic Characteristics of the Sample

| Dimensión      | Variables   | n= 588 | %    |
|----------------|-------------|--------|------|
| Sex            | Male        | 322    | 54.8 |
|                | Female      | 226    | 45.2 |
| Age            | 16–20       | 344    | 58.5 |
|                | 21–25       | 169    | 28.7 |
|                | 26–30       | 45     | 7.7  |
|                | 31–35       | 18     | 3.1  |
|                | Over 35     | 12     | 2.0  |
|                | First       | 203    | 34.5 |
|                | Second      | 173    | 29.4 |
| Year of Study  | Third       | 96     | 16.3 |
|                | Fourth      | 41     | 7.0  |
|                | Fifth       | 75     | 12.8 |
| Field of Study | Engineering | 262    | 44.6 |

|                  |                 |     |      |
|------------------|-----------------|-----|------|
| Region of Origin | Science         | 31  | 5.3  |
|                  | Humanities      | 240 | 40.8 |
|                  | Social Sciences | 28  | 4.8  |
|                  | Health          | 27  | 4.6  |
|                  | Coast           | 17  | 2.9  |
|                  | Highlands       | 68  | 11.6 |
|                  | Jungle          | 503 | 85.5 |

3.3. Tools and procedures

A structured form was used through the Google Forms platform for data collection. In the first section of the form, students were asked to provide sociodemographic and academic information.

In the second section, an Ad Hoc questionnaire developed by the authors was applied to assess the students' level of knowledge, emotional reactions, and behavioral tendencies regarding environmental conservation. This questionnaire was carefully designed to address each of the three key dimensions of attitude toward environmental conservation:

- Cognitive Component: This component assesses the students' level of knowledge about environmental conservation, including key concepts such as biodiversity, natural resources, and conservation strategies.
- Affective Component: Measures students' emotions, feelings, and evaluative attitudes toward environmental issues, such as concern for environmental damage and attachment to nature.
- Behavioral Component: Examines the behaviors and actions related to environmental conservation that students adopt, such as recycling, participation in environmental activities, and their willingness to contribute to concrete actions in their environment.

The questionnaire consists of 20 Likert-type items, with five alternatives, where one indicates "strongly disagree" and 5 "strongly agree." Each component's dimensions were specifically designed to reflect the students' perceptions, emotions, and behaviors in relation to the environment, and were based on previous theories of environmental attitude. Through a pilot test conducted with a small sample, it was determined that the questionnaire has high reliability ( $\alpha= 0.902$ ), ensuring the consistency of responses in each dimension.

Before data collection, authorization was obtained from university authorities. Students were then invited to participate via WhatsApp, and a survey link was received, along with a clear explanation of the research objectives. Informed consent was requested, and participants were guided through completing the questionnaire. The participation process took approximately 10 minutes. Once responses from the 588 students were confirmed, the survey was closed.

Both descriptive and inferential statistical techniques were used for data analysis. Descriptive statistics included a table assessing environmental conservation attitudes and their cognitive, affective, and behavioral components. The non-parametric Chi-square test ( $\chi^2$ ) was applied for inferential analysis to explore associations between attitudes and the proposed sociodemographic variables. Additionally, Spearman's correlation coefficient ( $\rho$ ) was used to analyze relationships between overall attitude and its dimensions.

3.4. Research ethics

The study was conducted in accordance with the principles set forth in the Declaration of Helsinki. Students received detailed information about the study's purpose and characteristics and

voluntarily provided informed consent, with full respect for their autonomy and the right to withdraw at any time. Measures were taken to protect the privacy and confidentiality of the data, ensuring participant anonymity and secure handling of the information collected.

## 4. Results

### 4.1. What is the attitude of university students from the Peruvian Amazon towards environmental conservation and towards the cognitive, affective, and behavioral dimensions of this attitude?

Descriptive results in Table 2 show that most participants reported a very favourable (46.9%) or favourable (36.1%) attitude toward environmental conservation. A smaller proportion expressed an indifferent (11.9%), very unfavorable (2.7%), or unfavorable (2.4%) attitude. Regarding the dimensions, the cognitive component had the highest proportion of very favorable responses (61.9%), followed by the affective (50.3%) and behavioral components (32.5%). However, the behavioral component also showed a greater percentage of indifferent responses (16.3%), suggesting that although participants possess knowledge and positive emotions regarding environmental conservation, this does not always translate into concrete actions.

**Table 2.** Descriptive Results of the Variable “Attitude Toward Environmental Conservation” and Its Dimensions

| Variable and Dimensions                    | Very Unfavorable |     | Unfavorable |     | Indifferent |      | Favorable |      | Very Favorable |      |
|--------------------------------------------|------------------|-----|-------------|-----|-------------|------|-----------|------|----------------|------|
|                                            | f                | %   | f           | %   | f           | %    | f         | %    | f              | %    |
| Attitude toward environmental conservation | 16               | 2.7 | 14          | 2.4 | 70          | 11.9 | 212       | 36.1 | 276            | 46.9 |
| Cognitive component                        | 25               | 4.3 | 16          | 2.7 | 42          | 7.1  | 141       | 24.0 | 364            | 61.9 |
| Affective component                        | 21               | 3.6 | 26          | 4.4 | 62          | 10.5 | 183       | 31.1 | 296            | 50.3 |
| Behavioral component                       | 19               | 3.2 | 26          | 4.4 | 96          | 16.3 | 256       | 43.5 | 191            | 32.5 |

### 4.2. To what extent is the general attitude of university students from the Peruvian Amazon towards environmental conservation associated with their sex?

As shown in Table 3, both male and female participants most frequently reported a very favorable attitude (45.7% and 48.5%, respectively), followed by a favorable attitude (36.0% and 36.1%, respectively). Indifferent attitudes were less common (13.4% in men and 10.2% in women), and unfavorable or very unfavorable responses were minimal. The Chi-square test ( $\chi^2 = 2.803$ ,  $p > 0.05$ ) indicated no statistically significant differences between male and female participants, suggesting that gender does not influence attitudes toward environmental conservation.

**Table 3.** Attitudes Toward Environmental Conservation by Gender

| Variable | Attitudes Toward Environmental Conservation |             |             |           |                | $\chi^2$ | p     |
|----------|---------------------------------------------|-------------|-------------|-----------|----------------|----------|-------|
|          | Very Unfavorable                            | Unfavorable | Indifferent | Favorable | Very Favorable |          |       |
| Male     | 2.2%                                        | 2.8%        | 13.4%       | 36%       | 45.7%          | 2.803    | 0.591 |
| Female   | 3.4%                                        | 1.9%        | 10.2%       | 36.1%     | 48.5%          |          |       |

#### **4.3. To what extent is the general attitude of university students from the Peruvian Amazon towards environmental conservation associated with their age?**

Table 4 shows that all age groups predominantly reported favorable or very favorable attitudes, though the percentages varied. For instance, 52.7% of students aged 21–25 expressed a very favorable attitude, compared to 43.9% of those aged 16–20. The highest level was seen in students aged 31–35 (55.6%), while those over 35 had the lowest very favorable score (33.3%). The Chi-square test ( $\chi^2 = 16.016$ ,  $p > 0.05$ ) showed no statistically significant differences by age.

**Table 4.** Attitudes Toward Environmental Conservation by Age Group

| Age Group | Attitudes Toward Environmental Conservation |             |             |           |                | $\chi^2$ | p     |
|-----------|---------------------------------------------|-------------|-------------|-----------|----------------|----------|-------|
|           | Very Unfavorable                            | Unfavorable | Indifferent | Favorable | Very Favorable |          |       |
| 16–20     | 2.6%                                        | 2.3%        | 14.5%       | 36.6%     | 43.9%          | 16.016   | 0.446 |
| 21–25     | 3.0%                                        | 1.8%        | 5.9%        | 36.7%     | 52.7%          |          |       |
| 26–30     | 2.2%                                        | 2.2%        | 15.6%       | 31.1%     | 48.9%          |          |       |
| 31–35     | 5.6%                                        | 5.6%        | 11.1%       | 22.2%     | 55.6%          |          |       |
| Over 35   | 0.0%                                        | 8.3%        | 8.3%        | 50.0%     | 33.3%          |          |       |

#### **4.4. To what extent is the general attitude of university students from the Peruvian Amazon towards environmental conservation associated with their field of study?**

As shown in Table 5, participants from all academic areas predominantly reported favorable or very favorable attitudes, with the highest very favorable responses in Social Sciences (64.3%), followed by Humanities (48.3%), Engineering (45.0%), and Health (40.7%). Very unfavorable attitudes were rare but more noticeable in Health (7.4%) and Social Sciences (7.1%). The Chi-square test ( $\chi^2 = 19.015$ ,  $p > 0.05$ ) indicated no statistically significant differences by academic field.

**Table 5.** Attitudes Toward Environmental Conservation by Field of Study

| Field of Study  | Attitudes Toward Environmental Conservation |             |             |           |                | $\chi^2$ | p     |
|-----------------|---------------------------------------------|-------------|-------------|-----------|----------------|----------|-------|
|                 | Very Unfavorable                            | Unfavorable | Indifferent | Favorable | Very Favorable |          |       |
| Engineering     | 1.1%                                        | 1.9%        | 11.8%       | 40.1%     | 45.0%          | 19.015   | 0.268 |
| Science         | 3.2%                                        | 6.5%        | 9.7%        | 38.7%     | 41.9%          |          |       |
| Humanities      | 3.3%                                        | 2.9%        | 13.3%       | 32.1%     | 48.3%          |          |       |
| Social Sciences | 7.1%                                        | 0.0%        | 3.6%        | 25.0%     | 64.3%          |          |       |
| Health          | 7.4%                                        | 0.0%        | 11.1%       | 40.7%     | 40.7%          |          |       |

#### **4.5. To what extent is the general attitude of university students from the Peruvian Amazon towards environmental conservation associated with their year of study?**

Table 6 presents attitudes by year of study. While favorable and very favorable attitudes predominated in all academic years, these percentages increased in upper-level students. For

example, the proportion of very favorable attitudes was 43.3% in first-year students and increased to 61.3% in fifth-year students. The Chi-square test ( $\chi^2 = 25.656$ ,  $p < 0.05$ ) revealed statistically significant differences based on academic year.

**Table 6.** Attitudes Toward Environmental Conservation by Year of Study

| Year   | Attitudes Toward Environmental Conservation |             |             |           |                | $\chi^2$ | p     |
|--------|---------------------------------------------|-------------|-------------|-----------|----------------|----------|-------|
|        | Very Unfavorable                            | Unfavorable | Indifferent | Favorable | Very Favorable |          |       |
| First  | 3.9%                                        | 2.5%        | 10.3%       | 39.9%     | 43.3%          | 25.656   | 0.049 |
| Second | 2.3%                                        | 1.7%        | 14.5%       | 37.0%     | 44.5%          |          |       |
| Third  | 2.1%                                        | 5.2%        | 14.6%       | 34.4%     | 43.8%          |          |       |
| Fourth | 2.4%                                        | 2.4%        | 19.5%       | 19.5%     | 56.1%          |          |       |
| Fifth  | 1.3%                                        | 0.0%        | 2.7%        | 34.7%     | 61.3%          |          |       |

#### ***4.6. To what extent is the general attitude of university students from the Peruvian Amazon towards environmental conservation associated with their place of origin?***

Table 7 displays the distribution of attitudes by participants' region of origin. A very favorable attitude was most prevalent among students from the Coast (76.5%), followed by the Jungle (46.9%) and the Highlands (39.7%). The Chi-square test ( $\chi^2 = 11.408$ ,  $p > 0.05$ ) revealed no statistically significant differences based on region of origin.

**Table 7.** Attitudes Toward Environmental Conservation by Region of Origin

| Region    | Attitudes Toward Environmental Conservation |             |             |           |                | $\chi^2$ | p     |
|-----------|---------------------------------------------|-------------|-------------|-----------|----------------|----------|-------|
|           | Very Unfavorable                            | Unfavorable | Indifferent | Favorable | Very Favorable |          |       |
| Coast     | 0,0%                                        | 0.0%        | 5.9%        | 17.6%     | 76.5%          | 11.408   | 0.180 |
| Highlands | 5.9%                                        | 4.4%        | 14.7%       | 35.3%     | 39.7%          |          |       |
| Jungle    | 2.4%                                        | 2.2%        | 11.7%       | 36.8%     | 46.9%          |          |       |

#### ***4.7. Is there a relationship between the general attitude towards environmental conservation and its dimensions (cognitive, affective, and behavioral) in university students from the Peruvian Amazon?***

Finally, Table 8 shows significant and positive correlations between the overall attitude toward environmental conservation and its dimensions. The strongest correlation was with the behavioral component ( $\rho = 0.926$ ,  $p < 0.01$ ), followed by the affective ( $\rho = 0.872$ ,  $p < 0.01$ ) and cognitive components ( $\rho = 0.782$ ,  $p < 0.01$ ). Furthermore, all components were significantly correlated with each other, with a particularly strong correlation between the affective and behavioral dimensions ( $\rho = 0.738$ ,  $p < 0.01$ ).

**Table 8.** Correlation Between the Attitude Toward Environmental Conservation and Its Dimensions

| Variable and Dimensions                       | 1       | 2       | 3       | 4 |
|-----------------------------------------------|---------|---------|---------|---|
| 1. Attitude toward environmental conservation | 1       | -       | -       | - |
| 2. Cognitive component                        | 0.782** | 1       | -       | - |
| 3. Affective component                        | 0.872** | 0.650** | 1       | - |
| 4. Behavioral component                       | 0.926** | 0.597** | 0.738** | 1 |

\*\* $p < 0.01$

## 5. Discussion

Currently, university students' attitudes toward environmental conservation have become a topic of significant interest due to increasing global ecological challenges. As future professionals and active citizens, their commitment to sustainability can influence the adoption of responsible practices that contribute to environmental protection. Understanding how students perceive and respond to environmental issues is essential for designing strategies that encourage greater involvement and a culture of sustainability both inside and outside academic settings. Accordingly, this research focused on evaluating the attitudes of university students in the Peruvian Amazon toward environmental conservation.

One important finding reveals that nearly half of the participants have a highly favorable attitude toward environmental conservation, indicating a high level of awareness and appreciation for the importance of protecting natural resources. This suggests that most students not only recognize the relevance of environmental care but also show a positive disposition toward its preservation, which may reflect greater ecological sensitivity and a potential intention to adopt sustainable behaviors in daily life.

Several studies support these findings. For example, Noguera (2023) identified a high level of interest among Guatemalan students regarding environmental preservation, showing a marked disposition toward pro-environmental behaviors. Similarly, Calderón & Camarena (2022) reported that a high percentage of Panamanian students expressed agreement with environmental protection, particularly highlighting the affective (68%), behavioral (63%), and cognitive (57%) dimensions of their pro-environmental attitude. Likewise, Şahin and Erkal (2017) reported that university students in Turkey generally had a positive attitude toward protecting the natural environment. In Peru, Tuesta et al. (2022) found that 98.1% of university students showed a positive attitude toward the environment.

When analyzing the dimensions of attitude toward environmental conservation, a significant difference was observed between knowledge and emotions versus action. While students demonstrated understanding of the topic and a favorable emotional connection, this disposition did not translate equally into behavior. This gap suggests the presence of barriers that hinder the translation of environmental knowledge and awareness into concrete actions. Consequently, there is a need for educational strategies that not only strengthen environmental awareness but also promote students' active and sustained engagement in ecological practices.

This finding aligns with Ordóñez et al. (2023), who found that while Ecuadorian nursing students demonstrated positive attitudes in the cognitive and affective dimensions, such disposition did not translate into observable pro-environmental behaviors. Similarly, Mamani et al. (2020) noted that although a significant percentage of students expressed favorable feelings toward environmental care, these emotions must be complemented by consistent, concrete actions reflecting real

commitment to conservation. These findings consistently point to a gap between declared attitudes and effective behavior.

Additionally, it was observed that as students progressed in their academic training, the proportion of highly favorable attitudes toward environmental conservation increased. This may be due to greater exposure to curriculum content related to environmental care and the development of critical awareness through university experience. Students in higher academic years may also have a deeper understanding of the consequences of the environmental crisis, positively influencing their attitudes and commitment to sustainability. Similar results were found in previous studies (Estrada et al., 2020; Estrada et al., 2021).

A major strength of this study lies in addressing a current and relevant issue—students' attitudes toward environmental conservation—by providing empirical evidence from a population affected by environmental and social problems. Furthermore, the study uses a validated instrument that evaluates the cognitive, affective, and behavioral dimensions of attitude, enriching the analysis and offering a comprehensive understanding of the phenomenon. Additionally, the participation of a large sample strengthens the robustness of the results and facilitates the identification of patterns in student perceptions. Altogether, these aspects enhance the internal validity of the study and its usefulness as a foundation for future research or educational interventions.

## 6. Conclusion

The results indicate that participants generally display a positive attitude toward environmental conservation, especially in the cognitive and affective dimensions. Cognitively, most students possess adequate knowledge about the importance of environmental protection, suggesting that environmental education has a positive impact on their understanding of ecological issues. In the affective dimension, the data show that students feel emotionally connected to environmental preservation, which may translate into a greater willingness to support pro-environmental initiatives.

However, the behavioral dimension reveals a gap. Although students express positive attitudes and favorable emotions toward the environment, the proportion of indifferent responses and the low levels of pro-environmental behavior suggest that knowledge and emotions do not always translate into concrete actions. This highlights that, despite having a favorable stance toward environmental conservation, factors such as lack of sustainable habits, limited opportunities for active involvement, or lack of practical motivation may hinder the translation of attitudes into real behaviors.

## 7. Suggestion

These findings carry important practical implications for designing and implementing educational strategies that promote an active environmental culture in universities. Since students show positive attitudes that do not always translate into specific actions, it is necessary to incorporate pedagogical methodologies focused on experiential learning, the development of sustainable projects, and active participation in ecological initiatives. Moreover, environmental education should be integrated transversally into academic curricula, fostering not only theoretical reflection but also responsible and sustained action. Strengthening the link between knowledge, emotion, and behavior could contribute to forming professionals genuinely committed to sustainability, capable of making a positive impact on personal, professional, and societal levels.

## 8. Limitations

It is essential to consider certain limitations when interpreting the results of this research. First, the study was conducted at a single university, which limits the generalizability of the findings to other institutions or educational contexts. Additionally, the use of a self-administered instrument

may have influenced responses due to social desirability bias. Furthermore, the cross-sectional design prevents the analysis of changes in students' perceptions over time. These limitations highlight the need to interpret the results with caution and suggest that future research should include more diverse samples and use complementary data collection methods. This would allow for a more comprehensive and accurate understanding of the phenomenon under study.

## Declarations

**Author Contributions.** Y.P.V. and R.Q.H.: Conceptualization, Literature Review, and Survey Design. E.G.E.A. and G.C.Q.: Methodology and Data Analysis. D.R.Q.P., V.S.N.Q., and Y.L.H.R.: Data Collection and Writing – Original Draft Preparation. M.V.D.F.: Supervision and Final Review-Editing. All authors have read and approved the final version of the manuscript.

**Conflicts of Interest.** The authors declare no conflict of interest.

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**Ethical Approval.** The study was conducted in accordance with the principles of the Declaration of Helsinki. Participants were informed about the objectives of the study and participated voluntarily, providing their informed consent. Measures were taken to ensure data anonymity, privacy, and confidentiality.

**Data Availability Statement.** The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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