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Analysis of Students' Environmental Literacy in Behavioral Dimension from a Humanistic Perspective

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Abstract

This study specifically examines the influence of humanistic values namely empathy, social responsibility, and freedom of thought on students' environmental literacy. Utilizing a quantitative approach, the research involved a sample of 55 students from the Chemistry Education program at a public university in Aceh, selected through stratified random sampling. Data were gathered using a 5-point Likert scale questionnaire that assessed both the affective and behavioral dimensions of environmental literacy alongside humanistic values. Multiple linear regression analysis was employed to evaluate the impact of these humanistic values on environmental literacy. The findings indicate that while students demonstrate a high awareness of environmental issues, their implementation of concrete actions remains limited. Although there is a strong interest in participating in pro-environmental activities, challenges persist in adopting sustainable habits, such as using environmentally friendly transportation. The study highlights that a humanistic educational approach, which emphasizes direct engagement and reflection, can enhance students' commitment to sustainable actions. Notably, 61.82% of students exhibited a moderate level of environmental literacy in the affective dimension, indicating a moderate emotional connection to environmental issues. Furthermore, social responsibility emerged as the most significant humanistic value, accounting for 66.13% of the variance in students' pro-environmental awareness and behavior. The implications suggest that higher education institutions should integrate humanistic values into environmental education curricula to bolster students' environmental literacy effectively.

Keywords: environmental awareness, environmental literacy, humanistic value, sustainable education

INTRODUCTION

Environmental literacy plays a crucial role in equipping individuals with the knowledge, skills, and values necessary to address global challenges related to environmental issues (Ariyatun et al., 2024; Figueiredo et al., 2023). For instance, climate change has impacted various aspects of human life, ranging from increased natural disasters to its effects on food security (Etzel et al., 2024). In this context, environmental literacy enables societies to comprehend the causes, impacts, and solutions for mitigating environmental pollution, through more sustainable lifestyles. Without adequate understanding, individuals and communities are less likely to take the necessary actions to adapt.

Environmental pollution also poses a severe threat to human health and ecosystem sustainability. Issues such as plastic waste, air pollution, and water contamination demand urgent attention (H. L. Chen et al., 2021; Gautam et al., 2024; Henderson, 2023; Manisalidis et al.,

2020; Saucier et al., 2023). Environmental literacy empowers individuals to understand the adverse impacts of these pollutants and encourages responsible behavior, such as waste segregation, using eco-friendly products, and participating in environmental preservation activities. It also provides practical skills for direct action, including recycling waste and reducing the consumption of non-renewable resources.

Environmental degradation, including deforestation, biodiversity loss, and deforestation, disrupts the balance of ecosystems that sustain human life. Through environmental literacy, individuals can understand the importance of maintaining the sustainability of natural resources and promote behaviors that protect ecosystems, such as reforestation and the preservation of conservation areas (Ariyatun et al., 2024). Environmental literacy fosters collective awareness and humanistic values, where each individual feels a responsibility to protect the environment for future generations. In an era where environmental crises are becoming increasingly evident, building environmental literacy is a strategic step in addressing these complex global challenges.

Humanistic education has strong relevance in fostering awareness and responsibility for the environment, as it emphasizes the holistic development of human potential, including moral values, empathy, and social responsibility. Humanism is an educational approach that places humans at the center of attention, focusing on the comprehensive development of individuals (Firmansyah et al., 2024; Nahdiyah et al., 2023). This approach views education not merely as a means of acquiring academic knowledge but also as a process involving the moral, social, and emotional growth of learners (Nasution, 2020).

In this context, education aims to create individuals who are not only intellectually intelligent but also deeply aware of the impact of their actions on others and the environment. Humanistic values such as empathy, freedom of thought, and collective responsibility teach individuals to appreciate the interconnectedness of humans and nature. By instilling these values, students are encouraged to understand that environmental stewardship is part of their moral obligation as members of the global community.

Environmental literacy in this study is defined as the ability of individuals to understand, analyze, and act upon environmental issues in a critical and responsible manner. It encompasses three main dimensions, engagement in environmentally responsible behaviors, environmental action strategies and skills, and students' intentions and commitment to pro-environmental actions. Humanistic values are defined as moral and ethical principles that include empathy, social responsibility, and freedom of thought. Behavior, in the context of environmental literacy, refers to the concrete actions taken by individuals that demonstrate their commitment to environmental sustainability.

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The Action Planning Theory and the philosophy of humanism offer complementary frameworks for understanding and promoting pro-environmental behavior. The Action Planning Theory, developed by Ralf Schwarzer is a psychological framework that focuses on how individuals can effectively plan and implement behavioral changes (Schwarzer, 2014).

This theory is highly relevant for understanding how people adopt new behaviors, such as pro-environmental actions, by emphasizing the importance of structured planning and self-regulation. Schwarzer's theory highlights the transition from intention to action through motivational and volitional phases, where individuals form intentions influenced by risk perception, self-efficacy, and outcome expectations, and subsequently translate these intentions into specific actions through detailed planning. This structured approach ensures that individuals are prepared to implement sustainable actions effectively, such as using eco-friendly products or participating in environmental initiatives.

In parallel, humanism supports learner-centered education by empowering individuals to think critically and make ethical decisions in addressing global issues, such as climate change and environmental degradation (Khatib et al., 2013; Kumari, 2024; Sharp, 2012). By connecting these issues to personal experiences and responsibilities, humanistic education encourages learners to become agents of change through reflection, active engagement, and moral responsibility. Together, these approaches provide a holistic strategy to develop individuals who not only care about the environment but are also motivated and prepared to take concrete actions toward sustainability

This study aims to explore aspects of students' environmental literacy behavior and examine the relevance of integrating humanistic values into strengthening this literacy. Specifically, this study addresses the following questions: What is the level of environmental literacy among students in terms of behavior? How relevant is the application of humanistic values in education to strengthen students' environmental literacy? and find out which humanistic values have the most influence on students' environmental literacy?.

Environmental literacy has emerged as a critical area of research, particularly in the context of education, as it equips individuals with the knowledge, skills, and attitudes necessary to address pressing environmental challenges. Numerous studies have explored various dimensions of environmental literacy among students. For instance, Fang et al. (2023) conducted a comprehensive analysis of environmental literacy in high school students, focusing on their knowledge and attitudes toward sustainability. Their findings indicated a significant gap between students' awareness of environmental issues and their actual engagement in pro-environmental behaviors.

Similarly, Liang et al. (2018) examined the environmental literacy

of undergraduate students in Taiwan, revealing that while students possessed a good understanding of environmental concepts, their practical application of this knowledge was limited. Liu et al., 2015) study showed that teachers' environmental literacy had a significant impact on students' environmental literacy.

In contrast to these studies, which primarily emphasize cognitive aspects of environmental literacy, the present research aims to explore the behavioral dimension of environmental literacy through a humanistic lens. By integrating humanistic values such as empathy, moral responsibility, and social awareness, this study seeks to understand how these values influence students' intentions and actions regarding environmental sustainability. Unlike previous research that has predominantly focused on knowledge assessment, this study will employ Action Planning Theory (Schwarzer, 1992) to investigate how students can effectively plan and implement pro-environmental behaviors.

Furthermore, while existing literature has highlighted the importance of environmental education, there is a notable lack of research that explicitly connects humanistic education with environmental literacy. This study aims to fill this gap by examining how humanistic principles can enhance students' engagement and commitment to environmental issues. By doing so, it contributes to the broader discourse on environmental education, emphasizing the need for a holistic approach that not only imparts knowledge but also fosters the values and behaviors necessary for sustainable living.

METHOD

This study uses a quantitative method. With a population of students of the Chemistry Education Study Program at one of the state universities in Aceh Province using the stratified random sampling technique, namely a sampling technique carried out by considering proportional strata or levels in the population, Stratified random sampling begins by dividing the sample units into a set of mutually exclusive and collectively comprehensive groups (Brown, 2010; Glasgow, 2005). In this case, it is the student intake from 2020 to 2024. This technique was chosen because the population is heterogeneous and consists of several different groups, allowing researchers to obtain representative samples from each intake. From the total student population, a sample of 55 people was taken, distributed proportionally based on the number of students in each intake, this was done to ensure that each intake was fairly represented in the study and to reduce the potential for bias in data collection.

This study was conducted through the stages of preparation, implementation, analysis, and interpretation, following research procedures adapted from Czaja et al. (2014) and Groves et al. (2011). During the preparation stage, the researchers developed an instrument in the form of a questionnaire to measure the affective aspects of environmental literacy and humanistic values among students. The

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questionnaire was developed based on an indicator framework modified from prior research by Fang et al. (2023) Hungerford & Tomera (1985), Hungerford & Volk (1990), Hungerford et al. (1990), Liu et al. (2015), Liang et al. (2018), dan Cherdymova et al. (2018). The instrument underwent expert validation to ensure its reliability and relevance.

The questionnaire was designed using a 5-point Likert scale, where a score of 1 indicated "strongly disagree," 2 indicated "disagree," 3 indicated "neutral," 4 indicated "agree," and 5 indicated "strongly agree." Data analysis was performed using Excel and SPSS Version 26. The criteria for categorizing students' environmental literacy are divided into three categories: high, medium, and low, as shown in Table 1.

Table 1. Criterion for Grouping Environmental Literacy

Score (X)	Category
M + SD ≤ x	High
M -SD ≤ X < M + SD	Medium
X < M -SD	Low

From Table 1, it is indicated that M = Mean; and SD = Standard Deviation. Based on this classification if X < 45 the category is Low; 45 ≤ X < 62, the category is Medium and X ≥ 62, the category is High.

To examine the influence of empathy, social responsibility, and freedom of thought (as independent variables) on environmental literacy (as the dependent variable), multiple linear regression analysis was employed. The data interpretation stage involves the use of Excel and SPSS output presented in graphs or tables, which were further elaborated through narrative analysis to provide deeper insights into the observed behavioral tendencies.

The percentage of the influence of each independent variable (X) on the dependent variable (Y) is calculated using the relative contribution (RC) values manually with Excel, using the following equation:

$$EC(X)\% = X.CC.100\%$$

$$RC(X)\% = \frac{EC(X)\%}{R^2}$$

note:
EC = effective contribution;
RC = relative contribution;
X = independent variable;
CC = coefficient correlation

The data interpretation stage involved the use of Excel and SPSS output presented in graphs or tables, which were further elaborated through narrative analysis to provide deeper insights into the observed behavioral tendencies.

RESULT AND DISCUSSION

The analysis of students' environmental literacy focused on the behavioral dimension, encompassing three main indicators: involvement in responsible environmental behavior, environmental action strategies and skills, and intention to act. These indicators were designed to evaluate the extent to which students not only possess environmental awareness but are also capable and motivated to take concrete actions in their daily lives. Data collection was conducted using a questionnaire comprising 14 statements covering various aspects of environmentally friendly behavior (Table 2).

The level of students' environmental literacy in the affective aspect.

Indicator 1: Involvement in Responsible Environmental Behavior

The results of the questionnaire measuring involvement in responsible environmental behavior (Figure 1) through five statements (S-1 to S-5) revealed varying levels of student engagement in responsible environmental practices. For statement S-1, which assessed students' active participation in environmental care activities such as tree planting or waste cleanup, the majority of respondents selected Neutral (45.5%), while 25.5% chose Agree, and 21.8% chose Strongly Agree. These results indicate that although some students actively participate, the majority tend to remain neutral, suggesting a lack of significant active involvement in environmental activities.

In statement S-2, which evaluated students' habits of disposing of waste according to categories, the proportion of positive responses was relatively high, with 38.2% selecting Agree and 25.5% selecting Strongly Agree. However, a Neutral response rate of 27.3% indicates room for improvement in the adoption of this habit.

Meanwhile, in statement S-3, which measured efforts to reduce single-use plastic usage, responses were dominated by Neutral (34.5%) and Agree (30.9%). However, this statement also showed a higher proportion of negative responses compared to others, with 7.27% choosing Disagree and 3.64% selecting Strongly Disagree. These findings suggest that efforts to reduce single-use plastic usage are not yet fully internalized among students.

Statement S-4, which assessed students' enjoyment in participating in environmental protection activities, received overwhelmingly positive responses, with 43.6% selecting Strongly Agree and 40% selecting Agree. This data indicates that emotional motivation to engage in environmental activities is strong among students. On the other hand, statement S-5, which evaluated students' habits of choosing environmentally friendly products while shopping, was dominated by responses of Agree (41.8%) and Neutral (21.8%). However, the proportion of Disagree responses (9.09%) indicates that this behavior has not yet become a priority for some students.

The data presented in Figure 1 reveal that students tend to engage in emotional and routine behaviors, such as proper waste disposal. These findings align with the core principles of humanistic philosophy, which emphasize the importance of personal experiences in learning. According to humanism, individuals have inherent potential to develop optimally through meaningful experiences. The high emotional motivation observed in students' participation in environmental protection activities, as reflected in statement S-4, illustrates that students derive personal satisfaction when their actions create a positive impact. This highlights that experience-based approaches, such as direct involvement in environmental activities, are effective

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Table 2. Questionnaire Statements for the Analysis of Environmental Literacy of Students in the Behavioral Dimension

Indicator	Statements
Involvement in Responsible Environmental Behavior	S-1. I actively participate in environmental care activities, such as tree planting or waste cleanup.
	S-2. I always dispose of waste in the appropriate bins based on category (organic and inorganic).
	S-3. I reduce the use of single-use plastics in my daily activities.
	S-4. I feel happy when I participate in activities aimed at protecting the environment.
	S-5. I choose eco-friendly products when shopping.
Environmental Action Strategies and Skills	S-6. I know how to process household waste into useful products, such as compost.
	S-7. I can identify environmental issues in my surroundings and seek appropriate solutions.
	S-8. I know how to conserve energy, such as electricity and water, in my daily life.
	S-9. I am capable of designing an action plan to address specific environmental issues.
Intention to Act	S-10. I have a strong intention to change habits that are harmful to the environment.
	S-11. Saya berkomitmen untuk menggunakan transportasi ramah lingkungan, seperti sepeda atau berjalan kaki.
	S-12. I want to contribute more to activities that support environmental sustainability.
	S-13. I plan to learn more about environmental issues and how to address them.
	S-14. I feel responsible for ensuring that future generations can enjoy a healthy environment.

The indicators were developed based on the research by (Fang et al., 2023) which was modified from the works of Hungerford & Tomera (1985), Hungerford & Volk (1990), Hungerford et al. (1990), Liu et al. (2015), Liang et al. (2018), dan Cherdymova et al. (2018).

strategies for fostering sustainable and responsible behaviors.

Humanistic theory also emphasizes the importance of freedom to choose and act based on intrinsic values. The study's findings, which reveal neutral responses to aspects requiring greater effort, such as reducing single-use plastic usage or choosing environmentally friendly products, highlight the need to enhance students' intrinsic awareness of the 1 a critical role in fostering enduring environmental literacy.

Humanism-based education, through interventions such as personal reflection, group discussions, and simulations of environmental impacts, can help students internalize the values of sustainability. Consequently, these strategies not only reinforce positive behaviors but also provide a foundation for students to become conscious and responsible agents

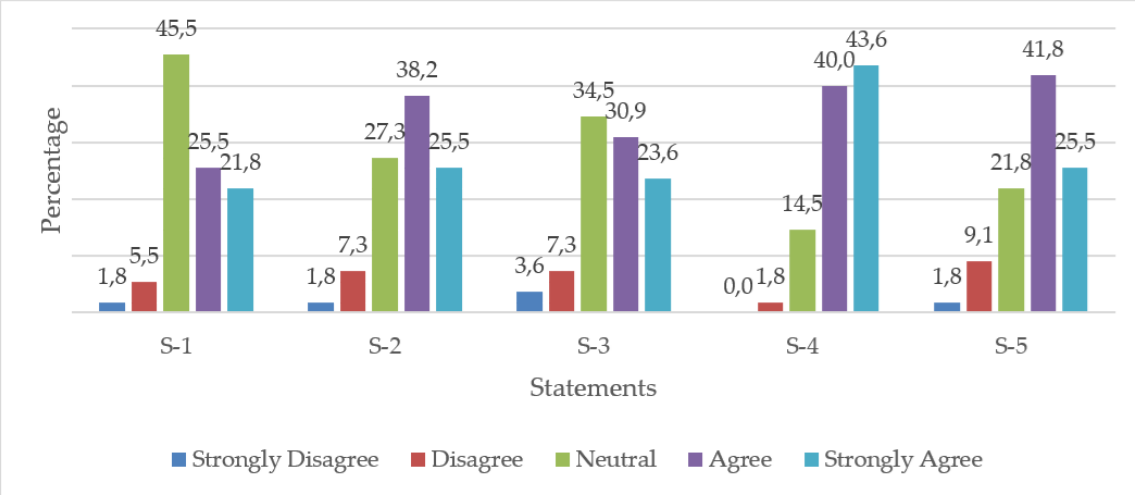

Figure 1. Student Opinions on the Behavioral Dimension Indicator of Involvement in Responsible Environmental Behavior

of change, aligning with the goals of humanistic education and the relevance of sustainability values for the future.

Indikator 2: Environmental Action Strategies and Skills

The questionnaire results measuring students' environmental action strategies and skills (Figure 2) through four statements (S-6 to S-9) reveal varying levels of student's abilities to apply relevant strategies and skills in addressing environmental issues. For S-6, which assesses students' ability to convert household waste into useful products such as compost, the majority of responses fell in the Agree category (50.9%), followed by Neutral (29.1%). Notably, 12.7% of students selected Strongly Agree. However, 7.27% of students chose Disagree, indicating that while a significant portion of students possess a basic understanding of waste management, this skill has not been fully internalized among certain individuals.

In S-7, which evaluates students' ability to identify environmental problems and devise appropriate solutions, most responses were also in the Agree category (41.8%) and Neutral (38.2%). Only 14.5% of students responded with Strongly Agree, suggesting that while some students feel confident in this ability, there remains a need to enhance their analytical and problem-solving skills to a deeper level.

S-8, which measures students' awareness of energy conservation practices such as saving electricity and water, recorded more positive responses compared to other statements. A total of 38.2% of students selected Strongly Agree, and 34.5% chose Agree, indicating that energy conservation awareness is relatively high among students. However, a Neutral proportion of 23.6% suggests that some students may either lack a full understanding or fail to consistently implement energy-saving practices in their daily lives.

For S-9, which examines students' ability to design action plans for addressing specific environmental issues, responses were dominated by Neutral (49.1%), followed by Agree (36.4%). A

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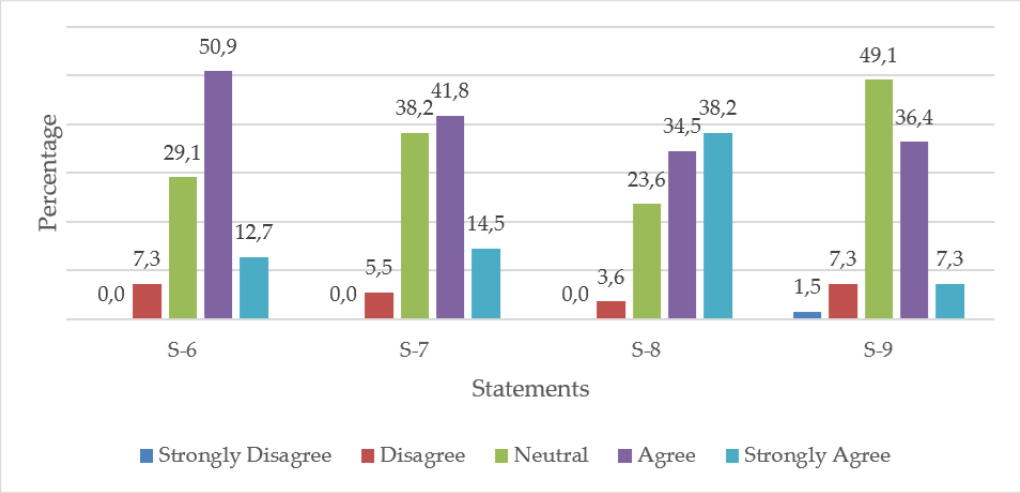

Figure 2. Student Opinions on the Behavioral Dimension Indicator of Environmental Action Strategies and Skills

small percentage (7.27%) chose Strongly Agree, while an equal proportion selected Disagree. This finding suggests that although some students have the ability to create action plans, the majority either feel uncertain or lack sufficient confidence to do so.

The data indicate that students are generally more skilled in practical aspects integrated with everyday activities, such as energy conservation, compared to more complex skills like designing action plans or converting waste into useful products. This aligns with existing literature indicating that the ability to devise strategic environmental solutions often requires experiential learning and targeted training (Ballantyne & Packer, 2009; Renfors, 2024; Sukackė et al., 2022).

These findings highlight the importance of strengthening educational programs that emphasize both practical and strategic skills for addressing environmental challenges. For example, integrating problem-based learning (PBL) into the curriculum could provide students with opportunities to identify local environmental issues, design solutions, and implement them. Additionally, technical skill training, such as composting or energy auditing, could enhance students' confidence in applying their knowledge to real-world actions. This study underscores the need for a more holistic approach to environmental education to build students' strategic competencies in supporting environmental sustainability.

Indicator 3: Intention to Act (Students' Intentions and Commitment to Pro-Environmental Actions)

The results of the questionnaire measuring students' behavioral dimension related to Intention to Act (Figure 3) show a variation in the level of students' intentions and commitment to pro-environmental actions, based on statements S-10 to S-14. For S-10, which measures students' intention to change harmful environmental habits, the majority of responses were in the Strongly Agree (45.5%) and Agree (38.2%) categories. This

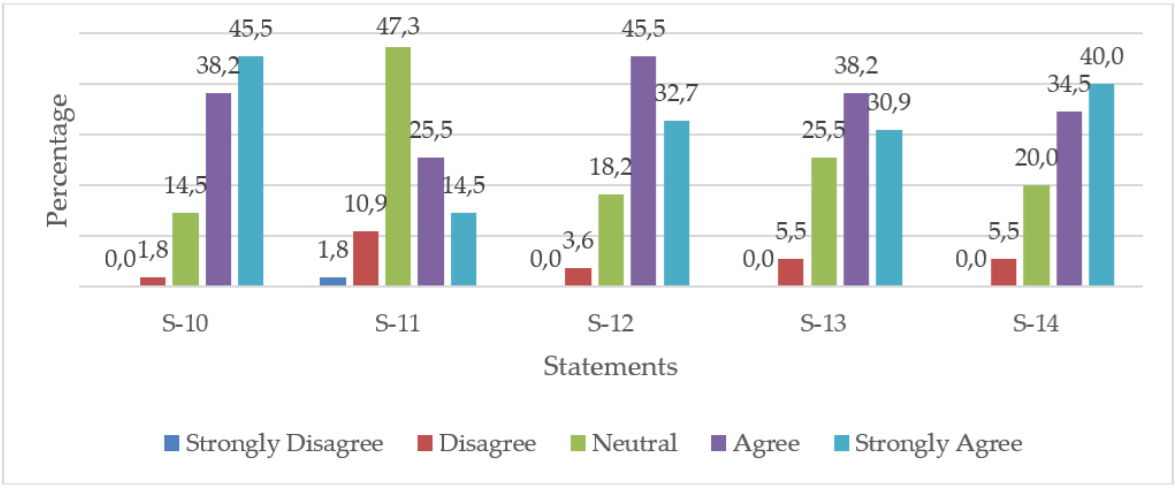

Figure 3. Student Opinions on the Behavioral Dimension Indicator of Intention to Action

indicates that most students have a high awareness of the need to change behaviors that negatively impact the environment. Only 14.5% of students selected Neutral, while none chose Strongly Disagree. These data reflect a positive intention among students to become more environmentally responsible.

The data presented in Figure 3 show a varied distribution of responses for statement S-11, which measures students' commitment to using environmentally friendly transportation. A total of 47.3% of students selected Neutral, indicating uncertainty or a lack of implementation of this practice. Nevertheless, 25.5% selected Agree and only 14.5% selected Strongly Agree. In contrast, 10.9% of students chose Disagree, suggesting challenges in adopting environmentally friendly transportation, such as limited infrastructure or unaltered habits. Statement S-12, which measures students' intention to contribute more to sustainability activities, showed a dominant response in the Agree (45.5%) and Strongly Agree (32.7%) categories. This indicates that most students are strongly inclined to engage in sustainability activities, while only 18.2% chose Neutral. For statement S-13, which assesses students' intention to learn more about environmental issues, the majority of responses fell in the Agree (38.2%) and Strongly Agree (30.9%) categories. A total of 25.5% selected Neutral, suggesting that while there is an intention to delve deeper into environmental issues, some students may still lack exposure to relevant information sources or fail to recognize the importance of additional knowledge. Statement S-14, which evaluates students' sense of responsibility to ensure that future generations can enjoy a healthy environment, received very positive responses. Forty percent of students selected Strongly Agree, and 34.5% selected Agree, showing that the majority of students feel a strong sense of responsibility. Only 20% selected Neutral and no students selected Strongly Disagree.

This study produced several key findings. First, students have a relatively high awareness and intention to act pro-

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environmentally, particularly in changing environmentally harmful habits and engaging in sustainability activities. Second, commitment to environmentally friendly transportation faces challenges, likely influenced by external factors such as accessibility or infrastructure limitations. Third, students show a strong sense of responsibility to ensure environmental sustainability for future generations, although there remains room to expand their understanding and knowledge of environmental issues.

These findings are in line with previous literature, such as the Theory of Planned Behavior (Ajzen, 1991), which asserts that intention is a key predictor of actual behavior. This study also supports research by Cabano et al. (2024) and Linder et al. (2022). which suggests that the intention to act pro-environmentally is often influenced by personal experiences and individual understanding of environmental issues. Furthermore, the literature indicates that intention is a crucial first step in initiating pro-environmental behaviors, but such intentions require supportive conditions for the implementation of tangible actions. To enhance students' commitment to certain aspects, such as environmentally friendly transportation, more applied educational approaches are needed, such as simulations or experience-based projects.

The findings also highlight the importance of providing broader access to environmental resources and information so that students can expand their knowledge of sustainability issues. By instilling a sense of intergenerational responsibility, environmental education not only improves students' literacy but also fosters awareness of the importance of sustainability for the future. These findings can serve as a foundation for designing campus-based intervention programs, such as green transportation campaigns, sustainability skills training, or experience-based projects that encourage students to turn their intentions into concrete actions that positively impact the environment.

From a humanistic philosophy perspective, an educational approach that supports the development of pro-environmental behavior is highly relevant. Humanism emphasizes that individuals have the capacity to choose and take responsibility for their actions. Providing students the freedom to explore environmental issues through experiential learning and engagement in real activities, such as environmental campaigns or sustainability projects, can strengthen their intention to act pro-environmentally. This approach not only raises awareness but also helps students find meaning in their actions, which is central to humanistic education. Moreover, humanism views individuals as beings with inherent potential for growth and self-actualization. This aligns with the research findings showing that students have a strong intention to learn more about environmental issues and take intergenerational responsibility.

Humanistic approaches to environmental education may include reflective activities, group discussions,

and field experiences. This strategy allows students to internalize sustainability values as part of their identity. By instilling values such as empathy, care for others, and respect for life, humanistic education creates a strong moral foundation for fostering transformation in individuals, enabling them to become responsible agents of change for the environment and society.

Students' Environmental Literacy in the Affective Dimension

The level of students' environmental literacy in the affective dimension is an essential indicator of their emotional engagement, values, and attitudes toward environmental issues. Understanding this aspect provides insights into how well students internalize environmental concerns and their readiness to adopt pro-environmental behaviors. Table 3 presents the distribution of students' environmental literacy levels in the affective dimension.

Table 3. Students' level of environmental literacy in the Affective Dimension

Category	Total Students	Percentage
High	12	21.82
Medium	34	61.82
Low	9	16.36

Table 3 shows the distribution of students' environmental literacy in the affective dimension, categorized into three levels: high, moderate, and low. The majority of students, 34 individuals (61.82%), fall into the moderate category, indicating that most students have a moderate level of attitude, values, and emotional commitment toward environmental issues. Meanwhile, 12 students (21.82%) fall into the high category, reflecting strong emotional attachment and values that drive their attention to environmental issues. On the other hand, 9 students (16.36%) are in the low category, indicating insufficient affective engagement with environmental issues.

These results align with the theory proposed by Kumsura et al. (2024) and Chen et al. (2024), which emphasizes that the affective dimension, such as values and emotional attachment to environmental issues, is a key factor in promoting pro-environmental behavior. The dominance of students in the moderate category may reflect ongoing educational efforts to raise environmental awareness, although further steps are needed to increase the number of students in the high category. Similar trends were found in the research by Husamah et al. (2022) and Kopnina (2020), which highlight the importance of value-based and humanistic education in strengthening environmental literacy, particularly in the affective dimension.

The relatively small percentage of students in the low category indicates the need for more focused interventions to enhance affective engagement, such as experience-based learning, activities that build empathy, and value-based education. These approaches have proven effective in previous studies (Aldrup et al., 2022; Lovren & Jablanovic, 2023) and can be applied to address gaps in environmental literacy, especially in the affective aspect.

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The Relationship Between Humanistic Values and Students' Environmental Literacy in the Affective Dimension.

This study uses independent variables (X) consisting of humanistic values: empathy (X1), social responsibility (X2), and freedom of thought (X3), and the dependent variable (Y) is environmental literacy (Y). In the initial stage, a classical assumption test was conducted, specifically a normality test, to ensure that the residual data from the regression model were normally distributed. Based on the results of the normality test, the significance value of 0.200 > 0.05 indicates that the residual data are normally distributed.

The descriptive analysis results show that the averages for variables X1, X2, and X3 are 4.173, 3.746, and 3.884, respectively, while the average for Y is 3.836. This indicates that, in general, empathy (X1) has the highest value compared to the other independent variables. The standard deviations for variables X1, X2, and X3 are 0.740, 0.655, and 0.643, respectively, while for variable Y, it is 0.621. The relatively small standard deviations suggest that the data are consistently distributed around the mean, reflecting a high level of consistency in the responses from the study participants. These findings provide an initial overview of the student's mastery of each variable, which will be further analyzed to assess their impact on environmental literacy.

Multiple linear regression analysis using partial t-tests was conducted to determine the influence of empathy (X1), social responsibility (X2), and freedom of thought (X3) on environmental literacy (Y).

Based on the results of the multiple linear regression analysis, the equation Y = -0.003 + 0.143X1 + 0.644X2 + 0.214X3 was obtained. This equation indicates that the constant value is −0.003, which implies that if there is no influence from the three independent variables, the environmental literacy score will decrease by 0.3%. The regression coefficient for X1 is 0.143, indicating that a 1% increase in empathy will result in a 14.3% increase in environmental literacy. The coefficient for X2 is 0.644, suggesting that a 1% increase in social responsibility will enhance environmental literacy by 64.4%. Similarly, the coefficient for X3 is 0.214, signifying that a 1% increase in freedom of thought will lead to a 21.4% increase in environmental literacy, assuming all other variables remain constant.

To determine the combined influence of all independent variables (X1, X2, and X3) on the dependent variable (Y), the results of the simultaneous F-test.

(ANOVA output) shows that X1, X2, and X3 collectively have a significant impact on students' environmental literacy, with a significance value of 0.000 < 0.05. This indicates that these three variables are key factors in shaping students' environmental literacy. Furthermore, the results in Table 8 reveal that humanistic values, as a whole, have a very strong influence on environmental literacy, with an R^2 value of 1.000, meaning the influence is 100%.

This finding demonstrates that the dimensions of humanism are not only

relevant but also crucial in building students' environmental literacy. The study aligns with previous findings, such as the study by Ly (2024), which showed that strengthening empathy and social responsibility significantly contributes to students' environmental awareness. However, the 100% influence of humanistic values in this study provides a new perspective, emphasizing the importance of fully integrating humanistic values. Another study by Muttaqin et al. (2024) also supports this finding, stating that humanistic education creates individuals who are more attuned to environmental issues. Therefore, the results of this study not only reinforce but also expand on previous theories, providing a strong foundation for the application of humanistic-based education to support students' environmental literacy. The percentage of influence of each variable X1, X2, and X3 on Y can be seen in Table 4.

Table 4. Percentage of the influence of variables X on variable Y

Relative Contribution (RC)	%
X1	13.77
X2	66.13
X3	20.07

The analysis results in Table 9 indicate that social responsibility has the most significant influence on students' environmental literacy, contributing 66.13%. This finding is consistent with previous research by Hadzigeorgiou & Skoumios (2013), which revealed that social responsibility is a key factor in developing environmental literacy. Students with high levels of social responsibility tend to have better understanding and pro-environmental behaviors. Additionally, Molina et al. (2013) support this finding, showing that social responsibility contributes 63.4% to influencing pro-environmental behavior among students across various countries. Similar results were reported by Fajeriadi et al., (2024) and Goldman et al. (2018), emphasizing the importance of social responsibility in shaping environmentally responsible behavior. Likewise, Hermawan et al. (2024) highlighted that social responsibility significantly enhances students' environmental literacy. These findings further underscore the importance of integrating social responsibility into efforts to improve environmental literacy.

CONCLUSION

The study reveals that while students demonstrate a high awareness of environmental issues, their implementation of concrete pro-environmental actions remains limited. They show significant interest in participating in sustainability initiatives but face challenges in adopting habits like environmentally friendly transportation. Most students (61.82%) exhibit moderate emotional engagement with environmental issues, indicating the need for stronger experience-based and value-driven interventions to deepen their affective involvement. Humanistic values, including empathy, social responsibility, and freedom of thought, significantly influence students' environmental literacy, with social responsibility contributing

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the most to shaping pro-environmental awareness and behavior. The findings highlight the importance of integrating humanistic values into environmental education curricula at the higher education level. Experience-based and reflective approaches are recommended to enhance attitudee engagement and foster pro-environmental actions, ultimately cultivating a generation committed to sustainability. This strategy underscores the role of education in preparing environmentally conscious individuals ready to address global challenges.

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