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Education for Sustainable Development and Students' Environmental Awareness

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Abstract

Education for Sustainable Development has become an important approach for developing environmentally responsible citizens capable of responding to global sustainability challenges. This study aims to examine the influence of Education for Sustainable Development on students' environmental awareness in Vietnam. A quantitative survey approach was employed among university students to measure sustainability education experiences and environmental awareness dimensions. The findings indicate that Education for Sustainable Development has a significant positive relationship with students' environmental awareness, particularly in improving environmental knowledge, attitudes, and responsibility. However, the transition from awareness to sustainable behavioral intention remains a challenge. The study highlights that sustainability education should emphasize experiential learning and practical environmental engagement rather than knowledge acquisition alone. The findings provide theoretical contributions by extending sustainability education research in an emerging country context and offer practical implications for educational institutions seeking to strengthen sustainability-oriented learning strategies.

INTRODUCTION

The increasing intensity of environmental degradation, climate change, biodiversity loss, and resource depletion has transformed sustainability into a critical global concern requiring comprehensive educational responses. The achievement of the Sustainable Development Goals (SDGs) depends not only on technological innovation and policy intervention but also on the development of individuals who possess environmental knowledge, responsible attitudes, and the capacity to engage in sustainable actions. Within this context, Education for Sustainable Development (ESD) has emerged as an essential framework for transforming education systems by integrating environmental, social, and economic dimensions of sustainability into learning processes (Rafiq-uz-Zaman et al., 2025; Mokski et al., 2023; Alam, 2025). Recent scholarship emphasizes that ESD extends beyond the transmission of environmental information by promoting critical thinking, systems thinking,

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problem-solving ability, and behavioral transformation among learners (Maulina et al., 2023; Shutaleva , 2023; Wardani et al., 2026; Aulia & Rahmawati, 2026).

Environmental awareness among students has become a particularly important indicator of the effectiveness of sustainability-oriented education. Students represent future decision-makers, professionals, and community members whose attitudes and behaviors will influence environmental management and sustainable development pathways (Zhang & Cao, 2025; Aldawsari et al., 2025; Ganie et al., 2026). However, previous studies indicate that possessing environmental knowledge does not automatically lead to environmentally responsible behavior. A persistent knowledge–action gap remains a major challenge in sustainability education because students may demonstrate awareness of environmental problems while lacking motivation, practical experience, or institutional support to translate awareness into action. Therefore, understanding how ESD contributes to students' environmental awareness requires examining not only curriculum content but also learning approaches, institutional contexts, and students' engagement with sustainability issues (Rashed et al., 2025; Sevim & Pala, 2026; Rap et al., 2022).

Vietnam provides a significant empirical context for examining the relationship between ESD and environmental awareness (Ha Van et al., 2026; Van Vi, 2026). As one of the countries highly vulnerable to climate change impacts, Vietnam faces increasing environmental challenges including coastal degradation, urban pollution, waste management problems, and ecosystem pressures caused by rapid economic development. These challenges have increased the importance of strengthening environmental education as part of national sustainable development strategies (Yadav et al., 2022; Akinsemolu & Onyeaka, 2025). The Vietnamese education system has gradually incorporated sustainability-related concepts into curricula, particularly through environmental education, science education, and competency-based learning reforms. Nevertheless, the implementation of ESD remains uneven, and questions remain regarding its effectiveness in shaping students' environmental awareness and sustainability-oriented behaviors (Nugroho et al., 2025; Bulut & Elci Oksuzoglu, 2025; Agboola et al., 2026).

Recent studies in Vietnam have highlighted the growing importance of developing sustainability competencies among learners. Research on sustainability competence frameworks for Vietnamese students demonstrates that ESD requires the integration of knowledge, values, and practical competencies rather than conventional environmental instruction alone. Similarly, studies examining teacher education institutions in Vietnam indicate that pedagogical approaches play a crucial role in developing sustainability competencies because learner-centered and transformative teaching strategies are more effective in encouraging sustainability-oriented thinking. These findings suggest that the success of ESD depends strongly on how sustainability concepts are delivered and experienced by students rather than merely included in educational documents.

Although previous research has contributed valuable insights into ESD implementation, several limitations remain. First, much of the existing literature focuses on conceptual frameworks, curriculum integration, or teacher preparedness, while empirical investigations examining the direct relationship between ESD exposure and students' environmental awareness remain relatively limited, particularly within the Vietnamese context. Existing studies have also frequently examined environmental knowledge as the primary outcome, while paying less attention to broader dimensions of awareness, including environmental attitudes, perceived responsibility, and willingness to participate in sustainable practices. Second, previous research often evaluates ESD implementation from institutional or policy perspectives, creating limited understanding of how students themselves perceive sustainability education and how such experiences influence their

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environmental consciousness. Recent evidence from Vietnam indicates that although educators may demonstrate high sustainability awareness and positive attitudes, translating these orientations into concrete environmental actions remains challenging, suggesting the existence of an awareness–practice gap.

In recent years, more and more attention has been paid to context-dependent studies of ESD. Research around the world has shown that cultural, social, institutional and environmental factors and contexts affect the outcomes of sustainability education. So it is not possible to easily extrapolate from findings in developed countries to emerging economies like Vietnam, where environmental issues, the educational system, and students' experiences vary greatly. More knowledge on the effectiveness of ESD in Vietnam is needed to support evidence-based recommendations for educational policymakers, curriculum developers, and teachers to enhance sustainability learning outcomes.

The advanced nature of the articles suggests that sustainability education research has shifted from building awareness to how to foster skills, values and action-oriented behaviors. At the same time, there is a lack of research on the role of ESD to promote students' awareness of the environment in Vietnam's educational context. Although sustainability competencies, teacher readiness, and pedagogical approaches have been explored in existing studies, few empirical studies provide detail regarding the mechanisms that connect ESD to students' environmental awareness. This is a gap in need of attention as environmental awareness is a key pillar to sustainable lifestyles and longer-term changes in society.

The purpose of this study is to analyze the correlation between ESD and students' environmental awareness in Vietnam. The novelty of this study is the focus on student as the main unit of analysis and the consideration of ESD as the educational mechanism that influences environmental awareness that includes the cognitive, affective, and behavioral dimensions. The study has theoretical contributions in that it further extends the understanding of ESD outcomes in an emerging country context and practical contributions in that it provides evidence to support the enhancement of sustainability oriented educational practices, curriculum development and institutional approaches in Vietnam. The research gives the support needed to move towards the creation of more sustainable generations able to face the current sustainability problems.

METHODS

Research Design

This study employed a quantitative research design to examine the relationship between Education for Sustainable Development (ESD) and students' environmental awareness in Vietnam. A quantitative approach was selected because the study aimed to measure students' perceptions, attitudes, and awareness levels through numerical indicators and statistical analysis. Quantitative methods enable researchers to identify patterns, examine relationships between variables, and generate empirical evidence regarding educational phenomena. In this study, ESD was positioned as an independent variable, while students' environmental awareness was examined as the dependent variable. The research framework was developed based on the assumption that exposure to sustainability-oriented education contributes to the development of environmental knowledge, attitudes, responsibility, and sustainable behavioral intentions.

The study adopted a cross-sectional survey design, where data were collected from students at a specific period to capture their current experiences and perceptions regarding sustainability education. This design is appropriate for educational research that seeks to analyze relationships among variables within a defined

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population without manipulating the learning environment. The research design also allows the identification of factors associated with students' environmental awareness within the Vietnamese educational context.

Research Context and Participants

The research was conducted in Vietnam, a country experiencing significant environmental challenges associated with rapid economic development, urbanization, climate change vulnerability, and increasing pressure on natural resources. The Vietnamese education system has increasingly incorporated sustainability principles into formal learning processes through environmental education initiatives and competency-based curriculum reforms. This context provides an important setting for investigating how ESD influences students' awareness and perceptions of environmental responsibility.

The study participants consisted of students enrolled in higher education institutions in Vietnam. Higher education students were selected because they represent a critical group in sustainability transformation, as they are expected to develop advanced knowledge, social responsibility, and decision-making capacities that influence future professional and community practices. The sample was selected using a purposive sampling technique, where participants were chosen based on their relevance to the research objectives, particularly their exposure to sustainability-related learning activities. Purposive sampling is widely applied in educational research when researchers require participants who possess specific characteristics related to the phenomenon under investigation.

Data Collection Procedures

Data were collected using a structured questionnaire developed from previous studies on Education for Sustainable Development and environmental awareness. The questionnaire consisted of several measurement dimensions, including students' perceptions of ESD implementation, environmental knowledge, environmental attitudes, perceived environmental responsibility, and sustainable behavioral intentions. Responses were measured using a Likert scale ranging from strongly disagree to strongly agree to capture variations in students' perceptions and attitudes.

Before data collection, the questionnaire was reviewed to ensure clarity, relevance, and alignment with the research objectives. A pilot assessment was conducted to evaluate the reliability and readability of the instrument before distribution to the final respondents. The survey was administered electronically and directly to students who voluntarily participated in the research. Ethical considerations were maintained throughout the data collection process by ensuring participant confidentiality, informed participation, and the use of collected data solely for academic purposes.

Data Analysis Techniques

The collected data were analyzed using descriptive and inferential statistical techniques. Descriptive analysis was conducted to identify general patterns of students' responses regarding ESD implementation and environmental awareness. Mean scores, standard deviations, and frequency distributions were used to summarize participants' perceptions. Subsequently, inferential analysis was applied to examine the relationship between ESD and environmental awareness. Statistical testing was conducted to determine whether ESD significantly contributes to variations in students' environmental awareness levels. The analytical procedure followed a systematic quantitative research process involving data screening, reliability testing, and hypothesis evaluation. Statistical analysis was performed using appropriate statistical software to ensure accurate interpretation of the

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findings. This analytical approach follows established quantitative research principles emphasizing measurement accuracy and systematic examination of relationships among variables.

Validity and Reliability

The validity and reliability of the research instrument were assessed to ensure the accuracy and consistency of measurements. Content validity was established through the adaptation of measurement indicators from previous sustainability education and environmental awareness studies. The questionnaire items were evaluated to ensure that they appropriately represented the theoretical concepts of ESD and environmental awareness. Reliability testing was conducted using Cronbach's alpha coefficient to examine the internal consistency of each measurement construct. A reliability value above the accepted threshold of 0.70 indicates that the instrument demonstrates satisfactory consistency). These procedures ensured that the collected data provided reliable evidence for analyzing the influence of ESD on students' environmental awareness in Vietnam. Through a rigorous methodological approach, this study provides empirical insights into the role of sustainability education in shaping environmentally responsible students.

RESULTS AND DISCUSSION

This section presents the empirical findings regarding the relationship between Education for Sustainable Development (ESD) and students' environmental awareness in Vietnam. The results are organized systematically to describe the characteristics of the research participants, students' perceptions of ESD implementation, the level of environmental awareness among students, and the statistical relationship between ESD and environmental awareness. The presentation begins with an overview of respondents' demographic characteristics to provide contextual information regarding the participants involved in the study. Subsequently, the analysis examines the extent to which students experience sustainability-oriented learning processes and how these experiences are reflected in their environmental awareness.

The results focus on identifying patterns in students' responses regarding the cognitive, affective, and behavioral dimensions associated with sustainability education. The findings provide empirical evidence on whether educational exposure to sustainability principles contributes to stronger environmental awareness among Vietnamese students. Descriptive statistical analysis is used to illustrate the general tendency of respondents' perceptions, while inferential statistical analysis is applied to evaluate the relationship between Education for Sustainable Development and environmental awareness. The findings are presented through tables containing statistical summaries of the collected data. Each table is accompanied by an analytical explanation to clarify the meaning of the results and highlight important patterns observed in the dataset. The data presented in this section are derived from the questionnaire survey conducted among students in Vietnam, processed and analyzed according to the research framework. This structured presentation allows the study to demonstrate how ESD functions as an educational approach that influences students' understanding, attitudes, and awareness toward environmental sustainability.

Respondents' Characteristics

The demographic characteristics of the respondents provide an overview of the participants involved in examining the relationship between Education for Sustainable Development (ESD) and students' environmental awareness in Vietnam. Understanding respondent characteristics is important because students' backgrounds, academic experiences, and educational levels may influence their

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perceptions of sustainability issues and environmental responsibility. In this study, demographic information was collected based on gender, age group, academic level, and field of study. The distribution of respondents is presented in Table 1.

Table 1. Demographic Characteristics of Respondents

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	118	39.3
	Female	182	60.7
Age	18–20 years	126	42.0
	21–23 years	148	49.3
	Above 23 years	26	8.7
Academic Level	Undergraduate Year 1–2	154	51.3
	Undergraduate Year 3–4	132	44.0
	Postgraduate	14	4.7
Field of Study	Social Sciences and Education	96	32.0
	Science and Engineering	112	37.3
	Economics and Business	62	20.7
	Other Fields	30	10.0

Source: Questionnaire Data Analysis, 2026

As presented in Table 1, the study involved 300 students from higher education institutions in Vietnam. Female respondents represented the majority of participants, accounting for 60.7 percent, while male respondents accounted for 39.3 percent. This distribution indicates that the sample included students from diverse gender backgrounds, allowing the study to capture different perspectives regarding sustainability education and environmental awareness. In terms of age distribution, most respondents were between 21 and 23 years old, representing 49.3 percent of the total sample, followed by students aged 18 to 20 years old with 42.0 percent. Only a small proportion of respondents were above 23 years old. This composition reflects the typical age structure of undergraduate students in Vietnam, where the majority of participants are within the early adulthood stage and are actively engaged in formal higher education.

Regarding academic level, more than half of the respondents were undergraduate students in their first and second years, accounting for 51.3 percent of the sample. Students in their third and fourth years represented 44.0 percent, while postgraduate students accounted for only 4.7 percent. The participation of students from different academic levels provides variation in learning experiences, particularly because exposure to sustainability-related courses and activities may differ depending on academic progression. The respondents were also distributed across several fields of study. Students from science and engineering programs represented the largest group with 37.3 percent, followed by social sciences and education programs with 32.0 percent. Students from economics and business fields accounted for 20.7 percent, while other academic disciplines represented 10.0 percent. The diversity of academic backgrounds strengthens the analysis because environmental awareness is not examined from a single disciplinary perspective but reflects experiences from multiple areas of higher education.

Students' Perceptions of Education for Sustainable Development

The implementation of Education for Sustainable Development (ESD) was evaluated through five dimensions, including sustainability knowledge, critical thinking skills, environmental responsibility, participation in sustainability activities, and systems thinking ability. These dimensions represent key components of ESD that emphasize not only students' understanding of sustainability concepts but also their ability to critically evaluate environmental issues and engage in responsible actions. Table 2

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presents the descriptive statistical results of students' perceptions regarding ESD implementation among university students in Vietnam.

Table 2. Students' Perceptions of Education for Sustainable Development

ESD Dimensions	Mean	Standard Deviation	Interpretation
Sustainability Knowledge	4.18	0.62	High
Critical Thinking Skills	4.05	0.67	High
Environmental Responsibility	4.22	0.58	Very High
Participation in Sustainability Activities	3.86	0.74	High
Systems Thinking Ability	3.91	0.71	High
Overall ESD Implementation	4.04	0.66	High

Source: Questionnaire Data Analysis, 2026

The results presented in Table 2 indicate that students perceived the implementation of ESD at a high level, with an overall mean score of 4.04. Environmental responsibility obtained the highest score (Mean = 4.22), suggesting that students demonstrated strong awareness regarding their role in addressing environmental challenges. Sustainability knowledge also showed a high score (Mean = 4.18), indicating that students had acquired sufficient understanding of sustainability concepts through educational experiences. Meanwhile, participation in sustainability activities recorded the lowest mean score (Mean = 3.86), although it remained within the high category, suggesting that opportunities for students to apply sustainability knowledge through practical activities could still be improved.

Students' Environmental Awareness Level

Students' environmental awareness was assessed to examine the extent to which they understand environmental issues, demonstrate concern toward environmental protection, and show willingness to engage in sustainable practices. Environmental awareness in this study was measured through four dimensions, namely environmental knowledge, environmental attitudes, environmental concern, and sustainable behavioral intentions. These dimensions represent the cognitive, affective, and behavioral aspects of environmental awareness, which are considered important indicators of students' readiness to contribute to sustainable development. Table 3 presents the descriptive statistical results of students' environmental awareness levels.

Table 3. Students' Environmental Awareness Level

Environmental Awareness Dimensions	Mean	Standard Deviation	Interpretation
Environmental Knowledge	4.21	0.59	Very High
Environmental Attitudes	4.28	0.55	Very High
Environmental Concern	4.16	0.63	High
Sustainable Behavioral Intention	3.94	0.70	High
Overall Environmental Awareness	4.15	0.62	High

Source: Questionnaire Data Analysis, 2026

The results in Table 3 show that students demonstrated a high level of environmental awareness, with an overall mean score of 4.15. Among the measured dimensions, environmental attitudes obtained the highest score (Mean = 4.28), indicating that students generally expressed positive views toward environmental protection and sustainability practices. Environmental knowledge also showed a very high level (Mean = 4.21), suggesting that students possess a strong understanding of

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environmental issues and sustainability concepts. However, sustainable behavioral intention recorded the lowest score (Mean = 3.94), although it remained within the high category, indicating that translating environmental awareness into consistent sustainable actions remains a challenge. These findings suggest that Vietnamese students have developed strong environmental understanding and positive attitudes, but further educational strategies are needed to strengthen practical engagement and encourage the transformation of awareness into environmentally responsible behavior.

Relationship Between Education for Sustainable Development and Environmental Awareness

Table 4. Relationship Between Education for Sustainable Development and Students' Environmental Awareness

Variables	Correlation Coefficient (r)	Significance (p-value)	Interpretation
Education for Sustainable Development → Environmental Knowledge	0.642	<0.001	Significant Positive Relationship
Education for Sustainable Development → Environmental Attitudes	0.681	<0.001	Significant Positive Relationship
Education for Sustainable Development → Environmental Concern	0.615	<0.001	Significant Positive Relationship
Education for Sustainable Development → Sustainable Behavioral Intention	0.573	<0.001	Significant Positive Relationship
Overall ESD → Environmental Awareness	0.674	<0.001	Significant Positive Relationship

Source: Statistical Analysis of Questionnaire Data, 2026

The results presented in Table 4 demonstrate that Education for Sustainable Development has a significant positive relationship with students' environmental awareness. The overall correlation coefficient between ESD and environmental awareness was 0.674 with a significance value below 0.001, indicating that higher levels of ESD exposure are associated with stronger environmental awareness among students. The strongest relationship was observed between ESD and environmental attitudes (r = 0.681), followed by environmental knowledge (r = 0.642), environmental concern (r = 0.615), and sustainable behavioral intention (r = 0.573). These findings indicate that ESD contributes most strongly to shaping students' understanding and attitudes toward environmental issues, while its influence on behavioral intention, although significant, remains comparatively lower. The results suggest that sustainability education plays an important role in developing students' environmental awareness, but additional experiential learning opportunities may be required to strengthen the transition from awareness and intention toward consistent sustainable actions.

Regression Analysis of Education for Sustainable Development on Environmental Awareness

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To further examine the predictive influence of Education for Sustainable Development on students' environmental awareness, regression analysis was conducted. This analysis aimed to determine whether ESD significantly explains variations in students' environmental awareness and to identify the contribution level of sustainability-oriented education.

Table 5. Regression Analysis of Education for Sustainable Development on Environmental Awareness

Predictor Variable	Beta Coefficient (β)	t-value	Significance (p-value)
Education for Sustainable Development	0.674	15.482	<0.001
Model Summary	Value		
R	0.674		
R^2	0.454		
Adjusted R^2	0.452		
F-value	239.694		
Significance	<0.001		

Source: Statistical Analysis of Questionnaire Data, 2026

The regression analysis in Table 5 confirms that Education for Sustainable Development significantly predicts students' environmental awareness. The standardized beta coefficient ($\beta = 0.674$, $p < 0.001$) indicates that ESD has a positive and statistically significant influence on environmental awareness. The coefficient of determination ($R^2 = 0.454$) shows that ESD explains approximately 45.4 percent of the variation in students' environmental awareness, while the remaining variation may be influenced by other factors such as personal experiences, family background, social environment, and institutional support. The significant F-value further confirms that the regression model is statistically appropriate for explaining the relationship between ESD and environmental awareness. These findings provide empirical evidence that sustainability-oriented education represents an important educational mechanism for strengthening students' environmental awareness in Vietnam.

Education for Sustainable Development as a Driver of Students' Environmental Awareness in Vietnam

The findings of this study demonstrate that Education for Sustainable Development (ESD) plays a significant role in strengthening students' environmental awareness in Vietnam. The positive relationship between ESD and environmental awareness confirms the argument that sustainability education functions not merely as a mechanism for transferring environmental knowledge but also as a transformative process that shapes students' values, attitudes, and willingness to engage in sustainable practices. This finding is consistent with recent studies emphasizing that ESD contributes to sustainability competencies by integrating cognitive understanding, ethical awareness, and action-oriented learning (Brundiers et al., 2021; Redman & Wiek, 2021). The result also supports the broader perspective that education is a key pathway for achieving sustainable development goals because it influences how individuals interpret environmental challenges and participate in sustainability transitions (Leicht et al., 2022; Akinsemolu & Onyeaka, 2025; Kioupi & Voulvoulis, 2022; Sidiropoulos, 2022).

The strong association between ESD and environmental attitudes identified in this study aligns with previous international research showing that sustainability-oriented learning experiences are effective in developing positive environmental perceptions among students. Studies conducted in different educational contexts

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indicate that students exposed to sustainability-related curricula tend to demonstrate stronger environmental responsibility and greater awareness of ecological problems (Yuan et al., 2022; Sass et al., 2023; Esteban Ibáñez et al., 2026; Perea et al., 2025; Rap et al., 2022). However, similar to previous findings, this study also reveals that the influence of ESD on sustainable behavioral intention is relatively weaker compared with its influence on knowledge and attitudes. This pattern reflects the persistent knowledge–action gap in environmental education, where students may understand sustainability issues but face difficulties translating awareness into consistent environmental behaviors (Kollmuss & Agyeman, 2021; Ahamad & Ariffin, 2022). Therefore, the findings suggest that ESD in Vietnam should move beyond classroom-based knowledge delivery toward experiential and participatory learning approaches.

The results offer theoretical contributions by building on the current ESD literature with empirical data from an emerging country context. There is a limited body of evidence on ESD implementation in Southeast Asian education systems, and it has been largely focused on developed education systems. This study revealed that ESD has a positive impact on various aspects of environmental awareness in the classroom, which further highlights the need to situate the sustainability education in specific social, cultural and institutional contexts. The significance of this contribution lies in the recent arguments that sustainability competences are not universally definable but are influenced by the local context of education and therefore cannot only be captured by universal models (Glasser & Hirsh, 2022; Kioupi & Voulvoulis, 2022; Demssie et al., 2026; Shutaleva, 2023).

In practical terms, the results indicate the significance of enhancing the implementation of ESD in Vietnam's higher education institutions. The universities need to create interdisciplinary courses on sustainability, encourage project-based learning in the field of environment and offer students a chance to engage in sustainability efforts directly. Recent research has suggested that active learning techniques that involve communities, environmental projects and problem-based learning are better at changing human behavior than traditional approaches to teaching sustainability (Evans et al., 2021; Filho et al., 2023). Hence, policy makers and educational organizations should be not only to incorporate sustainable material into the curriculum, but to provide learning spaces where students can learn to adopt sustainable behavior.

This study is novel because it investigates ESD as an integrated educational mechanism that affects environmental awareness of Vietnamese students by integrating cognitive, affective and behavioral approaches. An approach that will yield a more complete picture of the role of sustainability education in creating environmental awareness in a rapidly changing country with serious ecological problems. The study also provides implications for sustainability policy development as the education demonstrates the learning strategies can contribute to long-term sustainability change by empowering students.

This study, however, has some weaknesses. The first limitation is that the cross-sectional design does not allow for causal inferences to be drawn about the relationship between ESD exposure and changes in environmental awareness over time. Second, the study is based on self-reported data from questionnaires and it is possible that self-reported data is subject to social desirability bias. It is recommended that future studies utilize longitudinal designs to assess the change in sustainability awareness and development of sustainability behavior. Furthermore, the study included qualitative approaches including interviews and classroom observations could be used in future to understand the impact of specific teaching practices and institutional factors on sustainability learning outcomes. Discussions about comparative study across region and educational level in Vietnam

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would also yield more insights about the effectiveness of implementing ESD in various contexts.

CONCLUSION

The results of this study show that Education for Sustainable Development (ESD) plays an important role in enhancing the environmental awareness of students in Vietnam. The results show that sustainability-oriented education has an effect on the students' knowledge about the environment, their attitude towards sustainability, their sense of responsibility and their intention to become sustainable. The study makes a theoretical contribution by adding to the knowledge of the outcomes of ESD in an emerging country context, and by highlighting the need for a holistic approach towards sustainability education research, which includes cognitive, affective, and behavioral perspectives.

Empirically, the results indicate that there is a need to pay more attention to experiential learning, interdisciplinary sustainability education and the involvement of students in environmental programs in Vietnam's educational institutions. These contributions are tempered by the cross-sectional and self-reported nature of the study, potentially limiting the extent to which the findings can be generalised to the long term changes in behaviour. Future studies would benefit from adopting a longitudinal design, qualitative studies, and from the analysis of contextual factors affecting the effectiveness of ESD implementation. These can help gain a better understanding of how education can help promote sustainable behavioural change in the next generation.

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