

Instructional Approaches in Promoting Learners' Pro-Environmental Behaviour

Jake M. Laguador¹, John Rey SR. Soverano²

¹College of Education, Bicol State College of Applied Sciences and Technology, Naga City, Philippines

² College of Education, Bicol State College of Applied Sciences and Technology, Naga City, Philippines

jmlaguador@astean.biscast.edu.ph, jrsrsoverano@astean.biscast.edu.ph

Corresponding author: jmlaguador@astean.biscast.edu.ph

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ABSTRACT:

Pro-environmental behaviour (PEB) serves as a catalyst for applying theoretical learning in an inclusive real-world context. This study examined the instructional approaches that promote PEB in inclusive higher education institutions (HEIs). Systematic literature review guided by PRISMA was utilized in the study and analysed peer-reviewed research papers published between 2016 and 2025 from major academic databases. Studies were selected based on relevance to instructional approaches, curriculum integration, and reported outcomes related to pro-environmental behaviour. Findings showed that experiential, participatory, context-responsive and values-oriented instructional approaches are evident in the reviewed articles. The instructional approaches are synthesized into three overarching themes: experiential and community-oriented environmental learning; environmental literacy, values and behavioural development; and inclusive curriculum integration and institutional support. Findings suggest that effective environmental education is achieved through the interaction of instructional design, contextual relevance, and inclusive institutional support. The study contributes to the implementation of inclusive environmental education curriculum by synthesizing diverse instructional approaches where the findings have important implications for educators to adopt inclusive learner-centred approaches emphasizing the need for holistic, and action-oriented strategies that move beyond awareness toward sustained pro-environmental behaviour.

Keywords: curriculum integration, community development, inclusive education, instructional design, thematic synthesis, sustainability

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1. Introduction

The growing environmental crisis is seen in climate change, biodiversity loss, and unsustainable consumption which has placed greater responsibility on higher education

institutions (HEIs) to foster pro-environmental behaviour (PEB) with inclusive education context. These are global issues that the United Nation Sustainable Development Goals (SDGs) would like to advocate by academic institutions in implementing inclusive environmental education

through various instructional approaches (Sadruddin, 2025; Nunes et al., 2025). The promotion of sustainable behaviour is increasingly being carried out through education systems in response to rising environmental challenges. Several authors believed that environmental education is widely viewed as a key pathway for developing environmental knowledge, shaping attitudes, and encouraging responsible behaviour (Nurkhin et al., 2025; Ogbo et al., 2024; dela Peña, Macale & Largo, 2018). Seikkula-Leino et al. (2021) conducted a curriculum analysis where they studied pro-environmental education from Finland, Sweden and Iceland and found out that sustainability should not remain an implicit cross-cutting concept but should be explicitly embedded in course objectives, instructional methods, and institutional policies. Meanwhile in Portugal, the study of Mendes et al. (2025) found out that environmental knowledge positively influences both environmental attitudes and pro-environmental behaviour, while environmental attitudes partially mediate the relationship between knowledge and behaviour.

Yet the application of students' environmental knowledge to actual behaviour remains a challenge. While environmental education increases awareness and concern, several studies have showed its impact on behaviour is often indirect, working through attitudes and intentions rather than leading to immediate action (Qi et al., 2025; Suárez-Perales et al., 2021; Liu et al., 2020; Garcia et al., 2016). Instructional approaches to promote affective domain of learning has been used to achieve specific learning outcomes. However, application of knowledge has fall short in practicing sustainable behaviours while fostering respect for eco-cultural diversity and indigenous environmental knowledge, pointing to a persistent knowledge-behaviour gap (Benzehaf et al., 2025; Nurkhin et al., 2025). As a result, the students could be made unaware of the role they should play in society for contributing to inclusive environmental stewardship and sustainable development. This disconnect is being highlighted as important issue on how instructional approaches in HEIs can better

support not just understanding, but meaningful and sustained pro-environmental action.

Environmental challenges are intensified in the ASEAN region by rapid urbanization, economic growth, population growth, industrial expansion, and rising consumption. These pressures led to regional efforts such as the ASEAN Environmental Education Action Plan and sustainability initiatives in higher education, which recognize education as key to promoting sustainable development (ASEAN, 2019; UNESCO, 2020). However, inclusive environmental education across ASEAN higher education institutions (HEIs) remains uneven. Various institutions are trying different ways on how sustainability and inclusivity can be integrated into curricula (Duran & Mariñas, 2024), teaching approaches, educational programs and institutional practices while still limiting consistent behavioural outcomes among students (Wamsler, 2020; Leal Filho et al., 2018). Given the region's vulnerability to environmental risks, HEIs are playing vital roles in implementing relevant instructional approaches and shaping the environmental behaviour of future professionals.

Instructional approaches refer to the pedagogical methods, teaching strategies, and learning experiences employed by higher education institutions to integrate inclusive environmental education and promote pro-environmental behaviour among students. Existing literature reveals several critical gaps on this area. First, there have been limited comparative research examining how different national contexts operationalize instructional approaches in environmental education, particularly within Southeast Asia (Liu & Green, 2024; Portus et al., 2024; Torroba et al., 2023). Second, many studies have been focusing on individual determinants of pro-environmental behavior such as attitudes, knowledge, and intentions (Bendijo & Hornejas, 2023; Janmaimool & Khajohnmanee, 2019) rather than on the instructional and curricular mechanisms that shape these outcomes. Furthermore, the dominance of cross-sectional and self-reported studies limits understanding of how instructional practices lead to sustained behavioural change over time. There is also

limited attention being given on how environmental learning are reinforced within the classroom instruction. The need for a more comparative examination of how inclusive environmental education is implemented and how it influences pro-environmental behaviour within specific educational contexts is highlighted by these gaps.

This literature review centres what instructional approaches are employed in the Philippine educational practices in fostering pro-environmental behaviour. This study can contribute to the broader discourse on Education for Sustainable Development (ESD) and Inclusive Education by highlighting the need for holistic, action-oriented, and context-responsive educational practices that align knowledge, values, and behaviour. Ultimately, this literature review addresses an urgent educational challenge on how higher education can more effectively prepare students not only to understand environmental issues but also to act upon them in meaningful and sustainable ways with culturally responsive learning experiences.

Objectives of the Study

This study aims to review instructional approaches used in the Philippines in promoting pro-environmental behaviour among learners in higher education institutions. Specifically, it seeks to:

1. Identify instructional approaches employed in the Philippine educational practices and its strengths in promoting pro-environmental behaviour.
2. Synthesize emerging themes from the literature on instructional approaches that may inform inclusive environmental education strategies.

2. Methodology

Research Design

This study employed a systematic literature review design to examine and synthesize existing scholarly works on instructional approaches used in the Philippines in promoting pro-environmental behaviour. A systematic literature review was deemed appropriate as it allows for the inclusion, analysis, and synthesis of diverse empirical and theoretical studies to generate a comprehensive understanding of a particular phenomenon.

Data Source and Abstraction

A systematic search of relevant literature was conducted using major academic databases, including Scopus, Web of Science, Google Scholar, and ScienceDirect. The search utilized combinations of keywords and Boolean operators such as: “*pro-environmental behavior*,” “*environmental education*,” “*instructional approaches*,” “*teaching strategies*,” “*curriculum implementation*,” and “*Philippines*”. The review limited the search to peer-reviewed journal articles published from 2016 to 2025 to ensure relevance and currency. Reference lists of selected articles were also manually screened to identify additional relevant sources. The inclusion and exclusion criteria are presented in Table 1.

Table 1 *Inclusion and Exclusion Criteria*

Category	Inclusion Criteria	Exclusion Criteria
Types of Research	Quantitative, qualitative, or mixed-method	Opinion papers, editorials, literature reviews, unpublished theses
Focus	Instructional approaches, pedagogical strategies, or curriculum implementation related to environmental education	Not related to environmental education
Respondents	Students/Teachers from Tertiary Level	Students/Teachers from Primary and Secondary level

Language	Published in English	Published in languages other than English
Article Type	Research Article with full text available	Books, and book chapters
Year of Publication	Published within the defined review period (e.g., 2016–2025)	Published 2015 and older
Country Origin	Philippines	Other countries

The articles published for the last 10 years from 2016 to 2025 were included in the study. Year 2025 has the most number (5 or 22.7%) of research articles included in the study followed by year 2024 (4 or 18.2%) and year 2022 (4 or 18.2%). In addition, 2 articles (9.1%) were included from year 2019 and another 2 articles (9.1%) in year 2023 while one (1) article each year for 2016, 2017, 2018, 2020 and 2021 with a total of 22 research articles.

Study Selection Process

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework was followed by the researchers in the

study selection process which strengthened the methodological rigor of the review by ensuring transparency in study inclusion decisions and reducing potential selection bias. Retrieved studies were screened in four stages: identification, screening, eligibility assessment, and final inclusion (Page et al., 2021). Titles and abstracts were initially reviewed for relevance, followed by a full-text assessment based on the established inclusion and exclusion criteria. Eligible studies were then included for synthesis and comparative analysis. Figure 1 presents the PRISMA Flow Diagram of Literature Research and Review Process.

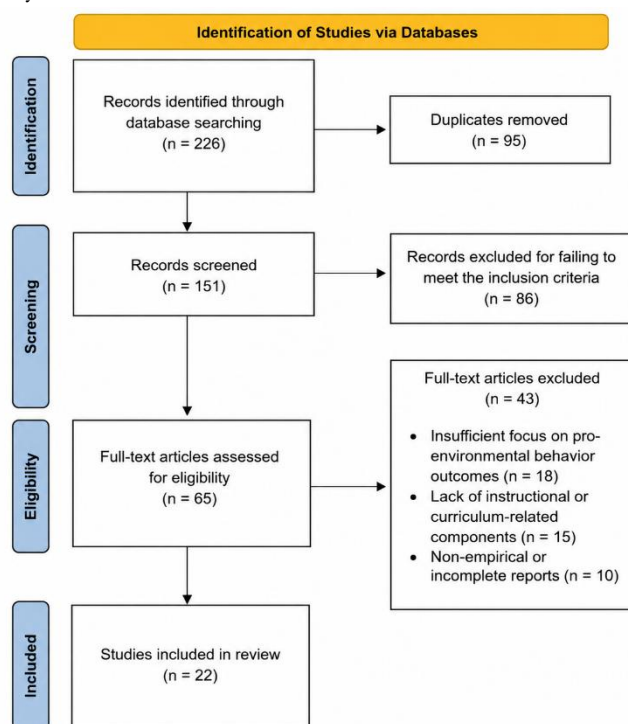


Figure 1. PRISMA Flow Diagram of Literature Research and Review Process

An initial search across databases yielded 226 records for the Philippines. After removing 95 duplicate records, 151 records remained for title

and abstract screening. During the screening phase, 186 records were excluded for failing to meet the inclusion criteria, primarily due to

irrelevance to instructional approaches, lack of focus on environmental education. This resulted in 65 full-text articles assessed for eligibility. Upon full-text review, 43 studies were excluded for the following reasons: insufficient focus on pro-environmental behaviour outcomes ($n = 18$), lack of instructional or curriculum-related components ($n = 15$), and non-empirical or incomplete reports ($n = 10$). Following the eligibility assessment, 22 studies met all criteria

and were included in the final comparative literature review.

Data Extraction

A data extraction matrix in Table 2 was developed to organize key information from the selected studies, including author(s), research design, instructional approach, contribution to PEB, and reported outcomes related to PEB.

Table 2 Example of Detailed Information

Name of Author/s	Fuentes, L.C.D.
Article Title	Climate Change Perception, Climate Change Anxiety, & Pro-environmental Behaviours of Tertiary Students.
Research Design	Quantitative descriptive-predictive design using survey and stepwise multiple regression analysis
Instructional Approach	Indirect emphasis on climate change education, environmental psychology-informed awareness-building, and affective engagement (climate perception and climate anxiety as behavioral drivers)
Contribution to Pro-Environmental Behaviour	Recommended integration of climate change education into academic and co-curricular programs; embedding climate discussions, advocacy events, and sustainability-oriented learning experiences in higher education curricula
Reported Outcomes	Climate change anxiety and climate change perception significantly predicted pro-environmental behaviour, explaining 34.9% of the variance. Higher climate anxiety and stronger climate threat perception were associated with greater pro-environmental behaviour. Participants showed average overall pro-environmental behaviour, with conservation lifestyle highest among dimensions. Findings suggest affective and cognitive factors are meaningful predictors of environmentally responsible action.
Country Context	Philippines (Tertiary students, Bacolod City)

Data Analysis

Thematic synthesis was utilized in analysing the gathered data where emerging themes related to instructional approaches were identified, and categorized by coding recurring concepts and grouping related instructional approaches into broader themes and subthemes. This iterative process enabled the development of overarching themes that captured the common pedagogical patterns and emerging strategies across the reviewed literature, providing a comprehensive understanding of how environmental education

is being implemented and how it contributes to the development of PEB in higher education institutions.

Trustworthiness and Rigor

The review employed transparent search procedures, explicit selection criteria, and systematic data extraction procedures to enhance rigor. The researchers utilized peer debriefing and intercoder agreement during thematic categorization to strengthen the consistency and credibility of data interpretation. Additionally, the

use of multiple databases and source triangulation supported the comprehensiveness and trustworthiness of the review findings.

3. Results and Discussion

The discussion of instructional approaches employed in Philippine educational practices highlights how inclusive environmental education is operationalized to promote PEB. The range of pedagogical strategies identified in the reviewed studies is examined in this section.

There are curriculum integration practices, and instructional delivery models have been used in the country that influence environmental awareness and behavioural outcomes. The discussion provides a foundation for understanding how inclusive environmental education contributes to the development of PEB by analysing the instructional approaches within Philippine contexts. This also identifies patterns that inform inclusive teaching and learning practices in sustainability education.

Table 3 *Instructional Approaches Employed in Educational Practices Promoting Pro-Environmental Behaviour*

Instructional Approach	Description	Contribution to Pro-Environmental Behaviour	Sources
Curriculum Infusion Approach	Environmental concepts are embedded across subject areas and teaching-learning processes rather than taught only as stand-alone content	Supports sustained environmental awareness, ecological understanding, and environmentally responsible behaviour through continuous exposure	Torrejos & Israel (2022); Pilare & Acledan (2024); Mendiola & Hechanova (2025); Almencion et al. (2024); Abellera et al. (2025); Garcia et al. (2016); Mazo & San Juan (2019); Micayabas (2017)
Experiential Learning Approach	Learners engage in environmental projects, service learning, conservation activities, and applied environmental tasks	Promotes action competence, environmental participation, and translation of learning into environmental practice	(Molano & Manseguiao, 2025; Bueno et al., 2018; Bercasio & Remolacio, 2022; Bercasio, 2021; Bendijo & Hornejas, 2023)
Participatory and Community-Based Learning	Environmental learning is linked with community engagement, extension activities, and collaborative environmental action	Strengthens stewardship, collective responsibility, and community-oriented pro-environmental behaviour	(Bueno et al., 2018; Habagat et al., 2024; Mendiola & Hechanova, 2025)
Values-Oriented Environmental Instruction	Instruction emphasizes environmental ethics, ecological values, environmental concern, and behavioral responsibility	Supports internalization of environmental responsibility and sustained pro-environmental dispositions	(Reyes et al., 2025; Fuentes et al., 2024; Dela Peña et al., 2019; Almencion et al., 2024; Abellera et al., 2025); Micayabas (2017)

Context-Responsive / Place-Based Instruction	Environmental issues are taught through localized concerns such as waste management, disaster risks, and community ecological problems	Increases relevance, engagement, and transfer of environmental learning into action	(Habagat et al., 2024; Ibanez et al., 2023;; Torrejos & Israel, 2022; Pilare & Acledan, 2024; Bartolome et al., 2025)
Inquiry- and Problem-Based Learning	Learners analyse environmental issues, investigate causes, and propose solutions through reflective and inquiry-oriented tasks	Supports critical thinking, environmental problem solving, and action-oriented behaviour	(Pilaré & Acledan, 2024; Fuentes et al., 2024; Abellera et al., 2025)
Action-Oriented Environmental Education	Instruction explicitly targets environmental participation, conservation action, and behaviour as intended learning outcomes	Strengthens direct environmental action and pro-environmental behaviour formation	(Bartolome et al., 2025; Altarez et al., 2020; Almencion et al., 2024)
Policy- and Institution-Supported Environmental Education	Environmental education is reinforced through institutional initiatives and curriculum-level or policy-guided implementation	Strengthens continuity, legitimacy, and broader implementation of environmental learning	(Mendiola & Hechanova, 2025; Almencion et al., 2024); Mazo & San Juan (2019)

The reviewed Philippine studies as shown in Table 3 indicate that instructional approaches employed in promoting pro-environmental behavior are largely characterized by curriculum infusion (Torrejos & Israel, 2022; Pilaré & Acledan, 2024; Mendiola, Almencion et al., 2024; Abellera et al., 2025; Mazo & San Juan, 2019; Micayabas, 2017), experiential learning (Molano & Manseguiao, 2025; Bueno et al., 2018; Bercasio & Remolacio, 2022; Bercasio, 2021; Bendijo & Hornejas, 2023), participatory and community-based learning (Bueno et al., 2018; Habagat et al., 2024; Mendiola & Hechanova, 2025), values-oriented environmental instruction (Reyes et al., 2025; Fuentes et al., 2024; Dela Peña et al., 2019; Almencion et al., 2024; Abellera et al., 2025; Micayabas, 2017), context-responsive teaching

(Habagat et al., 2024; Ibanez et al., 2023; Torrejos & Israel, 2022; Pilaré & Acledan, 2024; Bartolome et al., 2025), inquiry- and problem-based learning (Pilaré & Acledan, 2024; Fuentes et al., 2024; Abellera et al., 2025), action-oriented environmental education (Bartolome et al., 2025; Altarez et al., 2020; Almencion et al., 2024; Fuentes et al., 2024), and policy- and institution-supported environmental education (Mendiola & Hechanova, 2025; Almencion et al., 2024; Bueno et al., 2018). A consistent pattern across the studies of Filipino authors suggests that Philippine educational practices tend to promote PEB by embedding environmental concepts across teaching-learning processes, connecting instruction to local ecological realities, engaging learners in participatory and community-linked

environmental experiences with respect for cultural diversity, and cultivating environmental responsibility through values and action formation. Filipino culture of “*bayanihan*” is integrated in community-based environmental learning where collective action, mutual assistance and respect, and volunteerism are frequently demonstrated in responding to the recurrent typhoons, floods, volcanic eruptions, and other natural disasters affecting the country. The country's continued exposure to these climate-related hazards reinforces the need for instructional approaches that combine environmental knowledge with community engagement, and disaster preparedness. These approaches are strengthened when supported by inquiry-oriented learning, institutional environmental initiatives, and curriculum-level integration, reinforcing pro-environmental behavior not as an isolated outcome of environmental awareness alone, but as a product of integrated, contextually meaningful, and action-oriented educational processes.

Strength of Instructional Approaches

The summary of major strengths of Philippine instructional approaches based on the reviewed studies is presented in Table 4. The Philippine studies strongly emphasize contextual relevance, social engagement, values formation, and supportive educational structures in developing the sense of responsibility among the learners. Philippine educational practices derive effectiveness not only from what is taught, but also from how environmental education is situated within the lived experiences of the learners, community contexts, moral development, and broader educational systems. The community serves as a huge classroom for students to learn how to become resilient and sensitive to the needs of people. Students are given equal opportunity to be exposed in various community engagements through service-learning and civic engagement. Collectively, these features position Philippine approaches as particularly strong in making instructional approaches relevant, socially embedded and culturally responsive.

Table 4 *Major Strengths of Philippine Instructional Approaches*

Major Strength	Frequency	%	Description
Contextual Relevance	10	45.45	Instruction grounded in local environmental issues, real-life contexts, and culturally relevant learning experiences
Social Engagement (Community-Based Learning)	8	36.36	Emphasis on collaboration, community participation, service-learning, and stakeholder engagement
Values Formation (Ethics & Attitudes)	12	54.54	Development of environmental responsibility, ethics, attitudes, and sustainability values
Supportive Educational Structures (Curriculum & Institutional Support)	10	45.45	Curriculum integration, policy support, institutional programs, and structured environmental initiatives

Context-responsive instruction and strong community orientation have been considered the strengths based on the reviewed Philippine studies. Inclusive environmental education is grounded in localized ecological issues, making learning relevant to students' everyday experiences and increasing the likelihood that

environmental knowledge is translated into responsible action (Habagat et al., 2024; Ibanez et al., 2023; Torrejos & Israel, 2022; Pilare & Acledan, 2024; Bartolome et al., 2025). At the same time, environmental learning is extended beyond the classroom through community engagement, extension programs, and

participatory initiatives that position communities as active partners in environmental stewardship (Bueno et al., 2018; Mendiola & Hechanova, 2025; Bercasio & Remolacio, 2022; Bercasio, 2021). The students developed empathy and camaraderie when they joined service-learning programs with an end goal of uplifting the lives of the vulnerable and marginalized communities. Together, these approaches strengthen PEB by connecting environmental learning to authentic local contexts while reinforcing environmental responsibility through collective participation and shared community action.

Furthermore, environmental values formation and the curriculum or policy support are considered strengths in Philippine instructional approaches in promoting PEB. This gives

highlight on environmental education which consistently promotes ethical and cultural values, ecological responsibility, and moral commitment that enable learners to internalize inclusive environmental stewardship as a lasting personal and social responsibility rather than simply acquiring knowledge (Reyes et al., 2025; Fuentes et al., 2024; Dela Peña et al., 2019; Almencion et al., 2024; Abellera et al., 2025; Micayabas, 2017). This values-based orientation has been reinforced through curriculum integration and institutional support, which embed inclusive environmental education across learning processes and educational frameworks, providing continuity and sustained opportunities for the development of PEB (Torrejos & Israel, 2022; Mendiola & Hechanova, 2025; Almencion et al., 2024; Abellera et al., 2025).

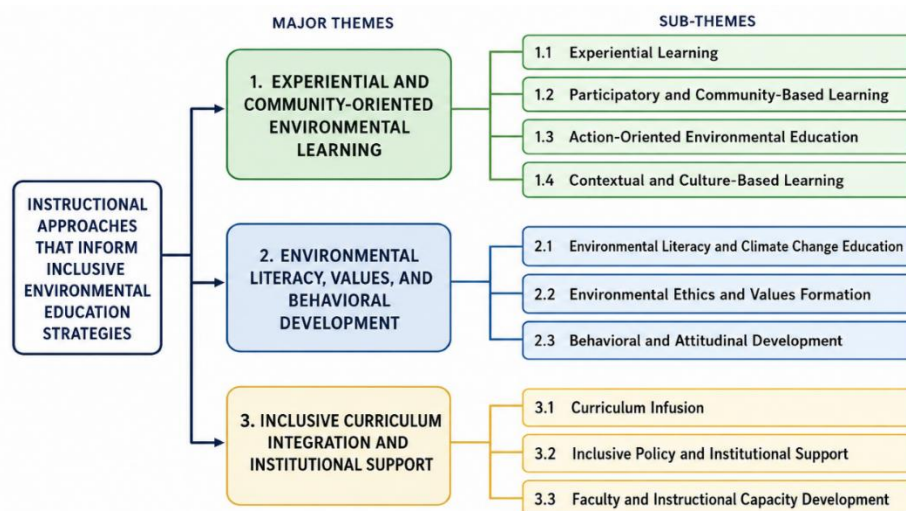


Figure 3. Synthesis of the Emerging Themes from the Reviewed Literature Related to Instructional Approaches

Theme 1: Experiential and Community-Oriented Environmental Learning

This theme focuses on learning by doing based on Experiential Learning Theory of Dewey et al. (1997) where the students are more likely to develop PEB when learning is anchored in doing rather than only knowing. This is where the students could be able to perform game-based learning, project-based learning, inquiry-driven tasks, and community engagement place students in real or simulated environmental contexts. In

this way, students are learning to make decisions, solve problems, and reflect on consequences towards taking actions from being sensitive and responsive to the needs of the community. This is also where Higher education institutions may adopt practice-oriented environmental education that integrates experiential and collaborative learning spaces to enable students to translate environmental knowledge into action-oriented learning experiences through designing curricula that prioritize experiential exposure and

intercultural competence as key learning outcomes to ensure that students leave not only informed but also capable of practicing sustainable behaviours in inclusive real-world contexts.

Theme 2: Environmental Literacy, Values and Behavioural Development

The importance of shaping how students think, feel, and value environmental issues as a foundation for behaviour is the highlight of this theme. Not only environmental awareness and attitudes but also a stronger sense of moral responsibility toward the environment can be developed through instructional approaches such as environmental literacy education, ethics-based instruction, digital and media learning, and behavioural theory-informed strategies. Reviewed studies showed that these approaches recognize that PEB is often mediated by internal factors such as values, beliefs, and emotional engagement. The implication for HEIs is the need to provide instructional designs which will lead to learning experiences that go beyond content delivery. However, intentional connections between these cognitive and affective gains and opportunities for action should also be ensured to address the common gap between awareness and behaviour.

Theme 3: Inclusive Curriculum integration and Institutional Support

This theme emphasizes that sustainable behaviour is more effectively developed when environmental education is supported by the broader institutional ecosystem. This is where all stakeholders are involved in ensuring that the system works toward achieving a common goal. This means that adopting a whole-system approach for HEIs where sustainability is embedded in the curricula, co-curricular programs, research agendas, and campus practices. Establishing Institutional policies, green campus initiatives, and partnerships with communities can serve as strong support for instructional approach where every stakeholder is involved in providing consistent exposure and reinforcement of PEB. The lasting behavioural change requires alignment between instruction,

institutional practices, culturally responsive and gender sensitive programs, and inclusive environmental policies to transform the university into a living laboratory of sustainability and inclusivity where students continuously experience and practice environmentally responsible behaviours even, they are already working professionals.

4. Conclusion

This systematic literature review examined instructional approaches in Philippine educational practices and emerged three major domains: experiential and community-oriented environmental learning, environmental literacy, values and behavioural development, and inclusive curriculum integration and institutional support. These instructional approaches are consistently enhancing students' knowledge, attitudes, and intentions; however, its impact on actual behaviour remains uneven which reflect a broader pattern in the literature where educational interventions produce stronger cognitive outcomes than behavioural change. Meanwhile, the strength of Philippine instructional approaches lies in their integration of experiential learning, environmental values formation, community engagement, and curriculum support anchored in the Filipino culture of being resilient, which collectively foster culturally and contextually relevant learning experiences. Thus, the instructional approaches and context- and culture-responsive curriculum must be designed and utilized based on the specific needs of the learners for real-world application. Higher education institutions may consistently embed sustainability and inclusivity across curricula and campus operations to strengthen students' environmental competencies.

Several limitations should be considered when interpreting the findings of this study. The review was limited to studies published between 2016 and 2025 from selected databases, which may have excluded relevant unpublished or non-indexed literature, while many included studies also relied on self-reported measures that may not accurately reflect actual PEB. The diversity of

research designs and methodologies limited direct comparison across studies and prevented definitive conclusions about the effectiveness of specific instructional approaches. Furthermore, the focus on the Philippines, together with the

limited availability of longitudinal evidence and the influence of contextual factors beyond instruction, restricts the generalizability of the findings.

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6. Author Declaration

We hereby confirm that this review article is our original scholarly work.

The authors declare no conflict of interest in this publication.