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Teaching Environmentalism in Philippine Schools: An Empirical Integrative Review

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Abstract

Schools are recognized as crucial agents in promoting awareness and driving collective action against climate change, the most urgent issue of our time. This integrative review examines how schools have adopted this role, with a focus on understanding environmental education (EE) within the context of Philippine schools. It analyzes 21 peer-reviewed online journal articles published between 2000 and 2025 by Filipino authors. The review is framed around three theoretical lenses: Sustainable Development Goal 13 on Climate Action, Republic Act 9512, known as the National Environmental Awareness and Education Act of 2008, and UNFCCC's Action for Climate Empowerment (ACE). It identifies publication trends, methodological patterns, pedagogical approaches, and barriers to effectively integrating environmentalism into schools. Significant insights were found in this review, including: 1) a steady increase in published articles on environmentalism in schools between 2000 and 2025, with substantial representation from Luzon-based, Catholic, and teacher education institutions. 2) Quantitative research methods, particularly focused on self-perception of program effectiveness, dominate the publication trend, while qualitative and mixed-method studies are underutilized. 3) Further, interdisciplinary and participatory approaches to teaching and learning are increasingly integrated in higher education, whereas methods for teaching basic education students remain highly cognitive, indicating a knowledge-behavior gap. 4) The barriers to effectively integrating environmentalism in schools include limited curriculum space, inadequate teacher training, and a lack of an organized, whole-school approach toward sustainability. Despite these limitations, positive impacts on cognition and behavior are noted, although self-rater bias may be present. It is concluded that emotionally engaging, ethically grounded, and culturally rooted models of environmental education are needed. These models should involve youth, serving as avenues for consistently and collectively assessing and evaluating environmental education (EE) implementation, adoption, and integration, as anchored in Republic Act 9512, the ACE Framework of UNFCCC, and SDG 13. Approaches for integrating environmentalism in schools should also transcend classroom teaching and

learning, adopting a whole-school approach (WSA) that considers resources, cultural practices, and institutional support.

Keywords: environmental education, environmentalism, Philippine schools, integrative review, non-systematic review

Background of the Study

Modernity is a widely recognized catalyst for improved quality of life, undoubtedly leading to significant global economic and social progress. However, alongside the advancements it brings, climate change has intensified, demanding urgent attention and response (Edo et al., 2024). Sustainable Development Goal 13 highlights the need for global action to combat climate change and its effects. It emphasizes the importance of enhancing education, awareness, and institutional capacity in advocating climate change mitigation, adaptation, impact reduction, and early warning. Central to achieving this goal is the understanding that education, public awareness, and civic participation are crucial in building a climate-literate society.

Schools have long recognized the alarming reality of climate change and, as a result, continue to reevaluate and improve education to inspire action and collaboration towards adaptation to climate change (UNESCO, 2018), a movement rooted in environmentalism, defined as our individual and collective responsibility to the environment (Susskind, 2020). They continue to innovate, with their evolving curricula targeting the integration of the necessary knowledge, skills, values, and perspectives to understand and, consequently, responsibly respond to climate change. Such innovation, stemming from a systematic and scientific approach, focuses on collecting evidence-based data to determine actual issues and suggest specific solutions.

This organized, innovative approach adopted by schools to address climate change is influenced by Article 6 of the United Nations' Action for Climate Empowerment (ACE) with its six core dimensions: climate change education and public awareness, training, public participation, public access to information, and international cooperation (UNESCO & UNFCCC, 2016). Undoubtedly, schools, with their resources and position, can effectively conduct community-based research and provide evidence of the impacts of climate change in their respective communities, which they can communicate as evidence and use as the basis for recommending localized responses and adaptations. This same evidence also becomes the standpoint in revising the curriculum. A section in the literature review further discusses the scope of the ACE Framework.

In Philippine schools, topics on climate change and its impacts are integrated into environmental education, as mandated by the Republic Act 9512, also known as the National Environmental Awareness Education Act of 2008. The law requires various agencies and sectors to collaborate and ensure that all levels of education in the country incorporate topics and issues related to promoting sustainability, protecting the natural environment, and promoting responsible stewardship. Learning opportunities, therefore, should be provided to formal, non-

formal, indigenous, and out-of-school students, with learning content covering sustainability, climate change, biodiversity, and environmental protection. Inclusion of these topics and issues in the curriculum should be relevant to producing an environmentally conscious citizenry.

It is essential to examine the current status of environmental education in the Philippines to identify and project opportunities for enhancing and strengthening this law. Hence, an empirical integrative review was conducted to derive insights from online journal articles published by Filipino authors on Google Scholar over the past 25 years (2000-2025), covering the topics of environmentalism in schools and environmental education in the Philippines. The 25 years were chosen to highlight significant developments and transitions before and after the implementation of RA 9512 in 2008, as they are influenced by international mandates such as SDG 13 in 2015 and the ACE Framework of UNFCCC in 1992.

Statement of the Problem

Responding to climate change is both crucial and urgent. As schools promote awareness and collective action regarding climate change, it is essential to conduct an integrative review to understand the various approaches to incorporating environmentalism at all levels in Philippine schools. This review aims to critically assess these differences by examining empirical studies published online and conducted by Filipino authors over the past 25 years. To guide this investigation, the following research questions are posed:

1. What are the publication trends related to environmentalism/environmental education in the Philippines?

2. What pedagogical approaches to environmentalism/environmental education can be deduced from these published studies?

3. What methods, participant demographics, and issues can be referenced from these studies on environmentalism/environmental education in the Philippines?

4. What barriers (institutional, cultural, and societal) hinder implementing environmental education in the Philippines?

Statement of Specific Objectives

The objectives of this review are the following:

1. To determine the publication trends related to environmentalism or environmental education in the Philippines from 2000 to 2025.

2. To identify the pedagogical approaches to environmentalism or environmental education in the Philippines from studies published online from 2000 to 2025.

3. To describe the methods, participant demographics, and issues referenced from studies published online on environmentalism/environmental education in the Philippines from 2000 to 2025.

4. To examine the barriers (institutional, cultural, and societal) that hinder the implementation of environmental education in the Philippines as deduced from studies published online from 2000 to 2025.

Significance of the Study

Examining publication trends in studies on environmental education in the Philippines provides a comprehensive understanding of the growing interest and academic focus on environmentalism. This insight can uncover gaps and opportunities for future research. Similarly, analyzing the pedagogical tools and content of environmental education may reveal effective teaching practices that enhance curriculum development and instructional design. This empowers curriculum designers and scholars to build upon or refine existing pedagogical approaches. Further, evaluating the research methods authors use to depict environmental education in the Philippines highlights limitations and opportunities for improving future research methodologies. Lastly, identifying barriers to integrating environmentalism enables programs and solutions implemented by schools to be more inclusive, specific, and responsive.

Review of Related Literature

This section presents a timeline of environmental education (EE) in the Philippines, highlighting current scholarly contributions and innovations in this field, and the three relevant frameworks I utilized to analyze the articles in environmental education: the UNFCCC Action for Climate Empowerment (ACE) framework, Sustainable Development Goal (SDG) 13, and Republic Act 9512.

Timeline of Environmental Education in the Philippines

Tilbury (1995) regards the launch of the 1972 United Nations Conference on the Human Environment as the driving force behind the growing momentum of global environmentalism in the 1970s. Following this conference, environmental awareness and protection began to be integrated into science and social studies curricula, with discussions on various environmental concerns and priorities amplified. In the 1990s, Hart and Nolan (1999) observed the steady progression of environmental education, which has now begun incorporating science-based strategies to tackle environmental issues. Moreover, teaching methods for environmentalism have significantly improved, supported by educational practices that emphasize both immediate environmental solutions and long-term sustainability education.

As the global movement for environmentalism gains momentum, Philippine schools have also begun incorporating environmentalism into science and civic education classes. This initiative, stemming from the Philippine Strategy for Sustainable Development, is mandated by Republic Act 9512 (2008). This law promotes environmental awareness and responsibility, requiring the inclusion of environmentalism at all levels of education, most notably in formal education.

In addition to being incorporated into formal education, several universities have launched specific programs to enhance environmental education. For example, in 2003, the University of the Philippines Diliman founded the Institute of Environmental Science and Meteorology (IESM), which supports environmental education and research (IESM, n.d.). While UP created a research center devoted to environmentalism, some Catholic schools have introduced an institutional theocentric environmentalism that integrates the teachings of the *Laudato Si'* encyclical. For instance, in 2023, San Beda University began promoting environmental stewardship by declaring itself a *Laudato Si'* University. It implemented various sustainability initiatives, such as waste segregation, digitalization to minimize paper usage, and energy conservation efforts (San Beda University website, 2024). Similarly, Ateneo de Manila University has committed to aligning its strategic plan with the principles of integral ecology by 2029 and achieving the status of a *Laudato Si'* University. This initiative targets carbon neutrality in its operations and aims to transition the campus to fully utilize renewable energy (Cagsawa, Padua & Sy, 2024). Gutierrez et al. (2024) stress that reflecting on *Laudato Si'* serves as a guide for "care for creation," emphasizing that ecological conversion and community engagement are essential elements of environmental education.

At the same time, many scholars are engaging in discussions about environmentalism and environmental education. Cruz (2023) critiques the mechanistic viewpoint established by classical physics through her hermeneutic

research, asserting that materialism leads to a disconnected perception of nature, contributing to environmental harm. She advocates for re-establishing students' connections with the *Lebenswelt*, or life world, emphasizing the bond between humans and the environment. In another article, she emphasized the importance of adaptive pedagogical leadership in addressing sustainability issues, particularly about the digital transformation of teaching and learning (Cruz & Dulay, 2023). Similarly, Nieva (2024) advocates for sustainability reforms by examining the psychological factors that motivate pro-environmental behaviors. His research suggests that personality traits such as conscientiousness and openness can predict sustainability-focused actions among Filipinos; this data is derived from his authored tool, the Filipino Sustainability Consciousness Questionnaire (F-SCQ).

UNFCCC Action for Climate Empowerment (ACE)

One relevant framework shaping environmental education in the Philippines is the UNFCCC ACE Framework. It is based on Article 6 of the 1992 United Nations Framework Convention on Climate Change and Article 12 of the 2015 Paris Agreement. This framework has six priority areas: education, training, public awareness, public participation, access to information, and international cooperation (UNESCO & UNFCCC, 2016). These areas require holistic, inclusive, and participatory learning processes in promoting climate change education, whether in formal or non-formal settings.

This framework serves as a reference guide for countries developing education policies that integrate climate change education into their curricula and teacher training programs. In 2021, the ACE Agenda was launched as a suitable follow-up to the ACE Framework, introducing global initiatives through action programs, dialogues, and the extensive development and presentation of ACE strategies (UNESCO, 2021). It promotes methods and approaches that are values-based, interdisciplinary, and community-driven, while simultaneously strengthening students' cognitive, socio-emotional, and behavioral competencies.

Republic Act No. 9512, or the National Environmental Awareness and Education Act of 2008

In the Philippines, environmental education became institutionalized with the enactment of Republic Act 9512, also known as the National Environmental Awareness and Education Act of 2008. This law was signed in December 2008, sixteen years after the introduction of the ACE Framework in 1992, and it requires the incorporation of topics related to environmental awareness, protection, and ethics at all educational levels—formal, informal, or non-formal (Official Gazette,

2008). The act also mobilizes various sectors and agencies, including the Department of Education (DepEd), the Commission on Higher Education (CHED), the Department of Natural Resources (DENR), and the Technical Education and Skills Development Authority (TESDA), to promote sustainability by developing suitable, context-based educational content and practices. Further, the law emphasizes that environmentalism should also be integrated into disciplines beyond the sciences, particularly in areas related to values formation, civic responsibility, and practical methods for sustainability. This integration also extends to teacher training, the development of teaching resources, and community-based programs. Suggested topics for inclusion in the curricula include climate change, biodiversity, waste reduction and management, environmental protection, and conservation (DENR, 2010).

In basic education, subjects that include environmental topics are Science, *Edukasyong Pantahanan at Pangkabuhayan* (EPP), Technology and Livelihood Education (TLE), and *Araling Panlipunan* (AP). The sciences are expected to cover topics related to ecology and the environment, while TLE discusses sustainability and waste management. Likewise, AP integrates discussions on environmental laws and local issues (Department of Education website, n.d.).

In higher education, the law mandates that the National Service Training Program (NSTP) be offered within the Civic Welfare Training Services (CWTS). Through participation in this course, college students engage in community-based projects such as tree planting, clean-up drives, and disaster preparedness training (CHED & TESDA, as cited in RA 9512, 2008). Some institutions have also incorporated Environmental Science and Ecology as General Education (GE) electives. Additionally, in courses such as Environmental Engineering, Public Administration, and Development Studies, specialized courses on Environmental Planning, Sustainable Development, and Climate Change Studies are offered (CHED, 2014; Tesoro, 2020).

Moreover, November is designated as "Environmental Awareness Month" to raise national awareness about environmentalism. During this period, all schools and supporting agencies—including the Department of Education, the Department of Science and Technology, the Department of Environment and Natural Resources, the Technical Education and Skills Development Authority, the Commission on Higher Education, and the Department of Education—are encouraged to hold campaigns, seminars, and activities that promote environmentalism (RA 9512, 2008). They are also urged to collaborate on developing and improving environmental education policies and materials.

Lastly, the law highlights the significance of teacher capacity-building. Therefore, resources related to teacher training and community-based programs on

environmental education should be supported and consistently developed to ensure that teachers are well-prepared to teach environmentalism (DENR, 2016).

Sustainable Development Goal (SDG) 13: Climate Action

SDG 13, one of the 17 United Nations Sustainable Development Goals, calls for urgent action against climate change and its impacts. It advocates for integrating climate change measures into national policies, education, and programs that strengthen institutional and human capacities for climate resilience. It is adopted as part of the United Nations' 2030 Agenda for Sustainable Development, which ultimately aims to build climate resilience, reduce greenhouse gas emissions, and enhance adaptive capacities (United Nations, 2015).

SDG 13.2 encourages countries to integrate climate change measures into their national policies and planning processes, ensuring that their development frameworks prioritize mitigation and adaptation strategies. Meanwhile, SDG 13.3 specifically targets "improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning" (United Nations, 2015, p. 24). It also underscores the importance of mobilizing financial resources to support climate education initiatives in developing countries, particularly as they fulfill their commitments under the United Nations Framework Convention on Climate Change (UNFCCC).

While acknowledging that climate change is a global issue, SDG 13 recognizes that it is experienced acutely at the local level, particularly by vulnerable communities in developing countries. Thus, localized solutions, such as community-based disaster risk management and inclusive climate governance, are suggested. In this integrative review, the RA 9512 law provides a crucial reference for examining changes in curriculum design, institutional responses, and teacher engagement. It articulates how we have nationalized and localized our responses to the global mandates set by the UNFCCC and the ACE Framework, as well as SDG 13, by examining environmental education in the country.

Methodological Framework

The method described by Sukhera (2022) was employed in this empirical integrative review. Twenty-one peer-reviewed online articles on environmentalism in schools and/or environmental education in the Philippines, authored by Filipinos between 2000 and 2025, were selected for the review.

Three theoretical lenses were used to interpret the results: SDG 13, the UNFCCC ACE Framework, and RA 9512. These insights were derived from the narratives about these three, as presented in the literature review:

1) The UNFCCC ACE Framework serves as the normative guide for environmental education in Philippine schools, emphasizing six key pillars: education, training, public awareness, public participation, access to information, and international collaboration.

2) Similarly, SDG 13: Climate Action highlights the role of education in combating climate change, with Targets 13.2 and 13.3 specifically calling for improvements in education while focusing on awareness and institutional capacity related to climate change mitigation, adaptation, early warning, and impact reduction (United Nations, 2015).

3) Finally, RA 9512 stresses the integration of environmental education into the country's educational systems at both formal and non-formal levels, facilitating a review to assess how state policies are incorporated into teaching practices.

These three interrelated themes serve as anchors for the coding and synthesis of the 21 online articles on environmental education that I have examined.

Methodology

Literature reviews can be presented in various ways. As a research methodology, they may take flexible forms that prioritize the type of data generated and the methods used to obtain that data. Depending on their extent of adherence to certain protocols, literature reviews can be systematic or non-systematic (Snyder, 2019).

Non-systematic reviews, also known as narrative reviews, can provide a broad overview of a topic or problem without strict adherence to a methodology for data selection, evaluation and synthesis. They are adaptive and flexible, unlike systematic reviews, which require precise, predetermined, and refined protocols and are most often shaped by the expertise, interest, and narrative arc of the author (Grant & Booth, 2009; Greenhalgh et al., 2018). They could also initiate relevant discussions of emerging issues, have the capacity to expand, deconstruct, or reconstruct known theoretical frameworks, and could even construct a new theory, even without strict inclusion criteria. Furthermore, adopting a non-systematic review as a methodology enables authors to gather perspectives from diverse sources, which may include peer-reviewed articles, gray literature, and even personal observations (Ferrari, 2015). However, interpretations should be

systematically and cautiously done to avoid selection and publication bias (Snyder, 2019).

In writing research in education, a non-systematic review is a practical option, as it has the capacity to analyze trends in pedagogy, curriculum, and policies, using primary data and interpretive literature, without considering the method by which the data was obtained. One particular type of non-systematic review, the empirical integrative review, can combine data from various research approaches and can consequently discuss the nature and implications of a specific phenomenon or issue by seamless integration of quantitative and qualitative data (Torraco, 2016; Zazzara et al., 2021; Vervoom et al., 2022; Sukhera, 2022). Whittemore & Knafl (2005) further suggest that the approach can enhance our understanding of complex issues, such as environmentalism that is contextualized in education.

Given the diverse nature of the 21 articles included in the review in terms of research methodologies and participants, an empirical integrative review —a type of non-systematic review —was employed.

Sukhera (2022) outlines the phases in doing an empirical integrative review, which are followed in this study:

Problem Identification

Develop a research problem that is clear and aligns with the identified gaps and issues within the field of study or phenomenon necessitating a review.

This study centers on identifying publication trends, examining pedagogical approaches, describing the research methods employed by authors, and addressing institutional, curricular, and cultural barriers to teaching environmentalism in the Philippines from 2000 to 2025.

Literature Search

To enhance the search in the chosen database, use keywords. Additionally, identify the inclusion and exclusion criteria, considering the relevance and quality of the selected literature to be reviewed.

During the literature search phase, the Google Scholar database was utilized to gather peer-reviewed empirical studies published by Filipino scholars between 2000 and 2025. To optimize the retrieval of relevant literature, keywords such as "teaching environmentalism" and "environmental education" were

combined using Boolean operators (AND/OR). This approach yielded an initial pool of 49,990 entries, which were subsequently refined to 21 carefully selected studies based on their relevance, quality, and the clarity of the results presented.

Data Evaluation

Screen the studies initially selected for the review and assess their rigor and relevance to the research questions. This may involve reviewing abstracts, titles, and full texts, when necessary, potentially requiring several rounds of checks and balances before finalizing the total number of articles for review.

In this study, 23 research articles were critically examined, including evaluations of their abstracts, full texts, and methodologies. In the initial coding, the AI tool Grammarly was used. These initial codes were then verified, refined, and analyzed manually to ensure that the generated codes are valid and precise. The ethical use of AI was observed in accordance with the UNESCO guidelines (2021). Two articles were ultimately excluded from the review; one lacked a clear discussion of its methodology and a publication date, while the other did not provide a publication date.

Data Analysis

Guided by the research questions, employ a thematic analysis.

Braun and Clarke (2006) developed a six-step framework for conducting a thematic analysis. This framework was adopted in this review by performing these specific steps:

1. Familiarization with the data, which involves reading and re-reading the full texts.
2. Generating initial codes where meaningful segments of extracted data are given concise codes.
3. Searching for themes that will entail clustering of related codes into preliminary themes.
4. Reviewing themes by refining and checking coherence within each theme.
5. Defining and naming themes with their scope and boundaries described.
6. Finalizing the results, which involve writing the final synthesis of themes.

Presentation of Results

The summary of results should be written in a narrative or thematic format. This summary should be aligned with the research questions or topics raised.

In this study, the thematically analyzed results were interpreted through three lenses: the UNFCCC Action for Climate Empowerment (ACE) Framework, Sustainable Development Goal (SDG) 13, and Republic Act 9512. This interpretation focused on understanding the alignment between local school practices and legal mandates—both national and international—as they are related to environmentalism. This interpretive narrative synthesizes insights into publication trends, pedagogical methods, research methodologies, and barriers to the effective implementation of environmental education, as referenced in studies published online by Filipino scholars from 2000 to 2025.

Results and Discussions

Guided by the phases of conducting an empirical integrative review by Sukhera (2022) and utilizing the perspectives of the UNFCCC ACE Framework, SDG 13, and the Republic Act (RA) 9512 in interpreting the themes, the main findings of this study are presented below:

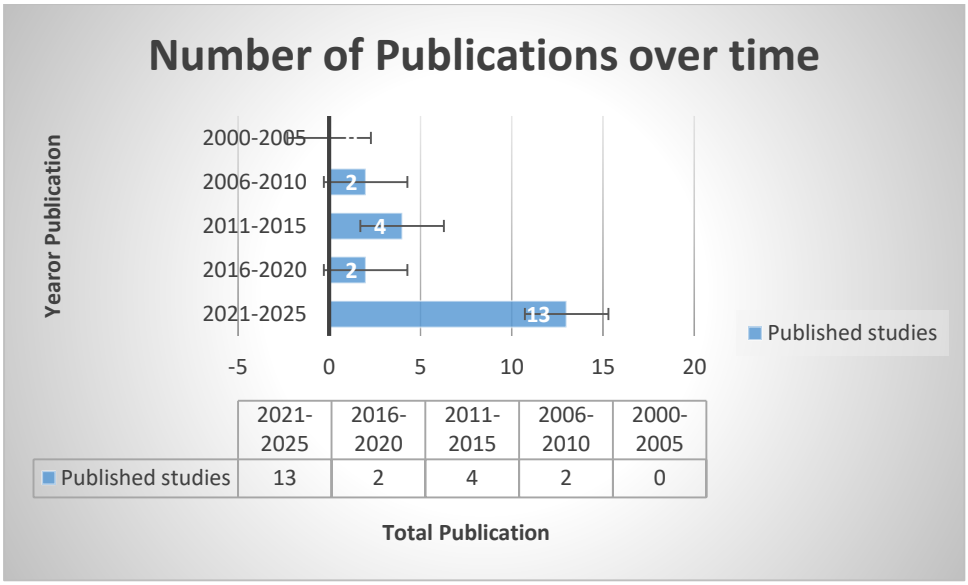
Publication Trends

In the selection of articles for this integrative review, search terms used are “teaching environmentalism” and/or “environmental education” in the Philippines. This search string was utilized in the Google Scholar database. The search terms could appear anywhere in the article, including the title, abstract, keywords, main text, or references. Articles published online by Filipino scholars from 2000 to 2025 were included. Out of 49,990 articles found on Google Scholar with these keywords, 23 were chosen for preliminary review. These selected articles are peer-reviewed, published between 2000 and 2025, and authored by Filipinos. Also, they clearly and systematically explored the integration of environmentalism into Philippine schools. Two articles were excluded from the selection because they lacked a publication date and a clear discussion of their methodologies.

In assessing the publication trends regarding environmentalism teaching in Philippine schools, each article was classified according to the year of publication, discipline, and the author's location.

Figure 1.

Publication Trends of Articles on Environmentalism in Philippine Schools 2000-2025



The number of journal articles focusing on environmental education in the country has significantly increased over the last five years, reflecting a steadily growing interest in the field since the enactment of RA 9512 in 2008. The country's major regions are well represented in authorship, with Luzon producing the most articles, including one that describes a Philippine School in Doha (Marinas et al., 2022). Science subjects at all levels, teacher education programs, general and graduate education courses, and Catholic education programs are identified as key avenues for integrating environmentalism in schools. Further, these representations suggest that formal education has actively incorporated environmentalism. In contrast, evidence of its integration in non-formal and informal settings appears to be limited, based on the available literature reviewed.

Pedagogical Tools, Content, and Responses

This review highlights the diverse teaching strategies and content implemented in Philippine schools for environmental education. These strategies include both structured, top-down methods like ecological curriculum design (Pabalan, 2023; David, 2022; Tan, 2019; Mendoza et al., 2024; Alaya-ay et al., 2012) as well as unstructured, bottom-up approaches that focus on community initiatives, emphasizing youth-led environmental advocacy and integration of Indigenous knowledge (Rosales, 2024; Fernandez & Shaw, 2013; Marinas et al., 2022).

Table 1.

Approaches to Teaching Environmentalism in Philippine Schools

Pedagogical Tools and Content	*Issues Referenced*
Top-down approach (formal education) ● the intersection of religious education, environmental philosophy, and clergy formation at the Seminary formation and graduate levels (Peracullo, 2022; Rosales, 2024) ● ecological curriculum design: the intentional inclusion of climate issues in educational objectives, content, and assessments (Pabalan, 2023; David, 2022; Tan, 2019; Mendoza et al., 2024; Alaya-ay et al., 2012) **Bottom-up approach** (informal education) ● Integration of Indigenous knowledge ● Youth-led environmental advocacy (Rosales, 2024; Fernandez & Shaw, 2013; Marinas et al., 2022) ● Laudato-Si inspired ecological responsibility (Waje, 2023) ● Theocentric environmentalism (Molino, 2022; Waje, 2023; Percullo,2022; Rosales,2024; Francisco, 2024; Baring, et al, 2024) ● Community engagement for environmental action (Francisco & Flores, 2024; Mendoza et al., 2024) ● Participatory disaster risk reduction activities (Fernandez & Shaw, 2013) ● Holistic "green" audit (Ogoc, 2015)	● Barriers to widespread curriculum integration (Galang, 2010; Fernandez & Shaw, 2013; Baring et al; Tan,2019; David, 2022) ● Weak whole-institution approach to sustainability (David, 2022; Tan, 2019) ● Curriculum constraints or lack of teaching resources ● Knowledge-behavior gap (Garcia, 2015; Alaya-ay et al., 2012) ● lack of continuous environmental assessment and improvement (Ogoc, 2015) ● Teachers limited environmental education (Arzadon, 2010; Corpuz et al., 2022; Canlas & Karpudewan, 2023) ● Demographic variables (age, economic status, and sex) influence students' awareness of global warming (Yanger, 2016)

Top-down approaches in environmental education are evident in seminaries, in basic and higher education, and even in graduate schools, as noted by Peracullo (2022) and Rosales (2024). These authors also share the observation that there appears to be a connection between religious and philosophical discussions on environmentalism. Environmental philosophy and ethics are

increasingly prioritized in higher education, with climate-related topics integrated as objectives in the curriculum and included in both formative and summative assessments of students.

In contrast, **bottom-up efforts** emphasize the role of students, communities, and religious institutions in promoting environmental awareness and action. These include community-engagement initiatives such as participatory disaster risk reduction (Fernandez & Shaw, 2013), youth advocacy movements (Marinas et al., 2022), and value-laden ecological responsibility inspired by *Laudato Si* and theocentric environmentalism (Molino, 2022; Waje, 2023; Francisco, 2024; Baring et al., 2024).

However, several barriers impede the country's consistent and effective implementation of environmental education. These include:

1. **Curricular and institutional limitations** include the lack of teaching materials and weak institutional commitment to whole-school sustainability (Galang, 2010; Tan, 2019; David, 2022).
2. **The knowledge-behavior gap** occurs when student awareness does not necessarily translate into environmental action (Garcia, 2015; Alaya-ay et al., 2012).
3. **Teacher capacity constraints**, including gaps in training and content mastery regarding environmental topics (Arzadon, 2010; Corpuz et al., 2022; Canlas & Karpudewan, 2023).
4. **Demographic disparities** exist in environmental awareness, which is influenced by socioeconomic status, age, and gender (Yanger, 2016).

Higher education employs innovative, engaging, and interdisciplinary approaches to environmental education. In contrast, basic education emphasizes knowledge, concepts, and the significance of agency in teaching. Additionally, there is an apparent discrepancy between knowledge-based methods and interdisciplinary, emotion-driven, and experiential approaches, with the former often being regarded as less effective in promoting pro-environmental behavior, while the latter prove to be significantly more effective.

The launch of the Laudato Si movement in several Catholic schools has further advanced environmentalism, aiding its integration into ethical discussions through topics such as eco-spirituality and communitarianism across various theology subjects (Tan, 2019; David, 2022; Molino, 2022; Waje, 2023). Additionally, an engaged pedagogical framework centered on the *flourishing of all, right relations, and praxis* is believed to be an effective tool for nurturing ecological consciousness in graduate education (Peracullo, 2022).

Variations in Research Methods, Participant Demographics, and Other Issues

Each article was classified based on its primary methodological approach, the types of data collected, and the research designs used. Among the 21 articles reviewed, 18 employed quantitative methods (85.71%), two used mixed methods (9.52%), and one conducted a qualitative case study (4.77%). Most studies relied primarily on surveys for data collection, with supplementary interviews and archival techniques used to enhance specific survey findings. All authors were affiliated with the institutions where their research was conducted, and the topics explored varied widely, including sustainability practices, levels of pro-environmental behavior, climate change awareness, the assessment of content knowledge in environmental education, and the effectiveness of teaching methods incorporating environmental themes.

Participants in these studies included students from basic and higher education, graduate students, and teachers who integrated environmental principles into their curricula. Furthermore, most measurement scales were self-developed, except for the Christian Environmentalism Scale (CES), utilized by Baring et al. (2024) and Molino (2022), and the Green Audit Scale, created by the University of Eastern Philippines. This scale was used to evaluate institutional actions towards "greening," all of which were framed within the broader concept of environmentalism (Ogoc, 2015). Additionally, all documents assessing the effectiveness of teaching approaches reported positive impacts on cognitive, attitudinal, or behavioral outcomes (Marinas et al., 2022; Canlas & Karpudewan, 2023; Mendoza et al., 2024; Baring et al., 2024; Garcia, 2015), although these results may reflect author and self-rater bias, as the authors were also the experimenters and assessments were limited to self-assessments.

The cognitive outcomes, particularly knowledge and awareness, were more evident and pronounced than the effects on emotional responses, attitudes, actions, and habits, highlighting the knowledge-behavior gap. Effective and innovative practices based on Friedman's model of critical thinking strategies (Garcia, 2015), the principles of Laudato Si (Tan, 2019), the VARK Model of Learning Styles (David, 2022), and the Value-Belief-Norm (VBN) Theory (Canlas & Karpudewan, 2023) were found to be integral in developing student activities that incorporate environmentalism.

Institutional, Curricular, and Cultural Barriers to Environmentalism in Schools

Limited institutional capacity and support, insufficient teacher training and resources, and curriculum overloading are identified as hindrances to the effective integration of environmental topics in education (Galang, 2010; Fernandez & Shaw, 2013). Cultural factors, including varying degrees of environmental awareness linked to socio-economic and demographic variables,

also influence student engagement (Yanger, 2016). This review highlights the necessity of participatory, interdisciplinary, and culturally sensitive approaches that incorporate indigenous knowledge and ethical considerations, aligning with the principles of RA 9512, the ACE Framework, and SDG 13 (Francisco & Flores, 2024; UNESCO & UNFCCC, 2016).

Conclusions

This integrative review revealed critical patterns in publication trends, pedagogical approaches, research methodologies, and implementation challenges. When interpreted through the lenses of Republic Act 9512, the Sustainable Development Goal (SDG) 13, and UNESCO's Action for Climate Empowerment (ACE) Framework, several insights emerge that highlight both progress and persistent gaps in environmental education (EE) across the country.

RA 9512 serves as the legal compass that institutionalizes environmental awareness and education across all levels of the formal education system (Congress of the Philippines, 2008). The reviewed literature confirms compliance with this mandate, specifically through the integration of environmental topics in science and social studies curricula. However, the uneven implementation of RA 9512 across regions, weak teacher training, and insufficient resources are observed, supporting the observation that a gap between policy and practice exists. Despite being a legally binding framework, RA 9512's full potential remains unrealized without systemic reinforcement, localized implementation, and dedicated capacity-building mechanisms.

On the other hand, SDG 13, notably Target 13.3, emphasizes the importance of strengthening education and raising awareness about climate change mitigation, adaptation, and early warning systems (UNESCO & UNFCCC, 2016). The increase in scholarly output on environmental education, particularly since 2020, reflects a growing recognition of this goal. However, most studies remain limited to measuring cognitive awareness, with minimal focus on behavioral transformation or long-term environmental stewardship. This "disconnect" between knowledge and action highlights the need to develop pedagogical designs that extend beyond awareness to foster climate resilience and agency among learners.

Lastly, the ACE Framework enhances understanding of the challenge by advocating for participatory, action-oriented, and values-driven environmental education (UNESCO & UNFCCC, 2016). The review indicated that while certain institutions—particularly faith-based and community-focused schools—embraced values-driven and interdisciplinary teaching approaches, many relied on traditional, top-down instructional methods. There is a concerning disparity

between higher education and basic education institutions regarding how they integrate environmentalism, with the former attempting to institutionalize it while the latter primarily focuses on cognitive approaches. The framework emphasizes the significance of collaborative knowledge creation, encourages public involvement, and crafts locally relevant solutions—concepts that remain vastly underutilized in the Philippines.

Summing up, environmental education should extend beyond what these three frameworks require. It should be transformative and should adopt a contextualized, institutional approach that is based on the insights of the same people or communities that are affected by climate change and other environmental issues.

Recommendations

This empirical integrative review of 21 peer-reviewed articles on environmental education in the Philippines, authored by Filipino scholars, draws relevant themes and insights. These themes and insights highlight gaps related to the integration of RA 9512, the UNFCCC Framework, and SDG 13 into environmentalism in schools.

Based on the identified gaps, the following recommendations are made.

Strengthen the Implementation of RA 9512 by Creating Localized and Contextualized Policies and Monitoring

While RA 9512 is recognized as a strong legislative foundation for environmental education in the Philippines, its localized implementation could be enhanced. The Commission on Higher Education (CHED), the Department of Education (DepEd), and the Department of Environment and Natural Resources (DENR) should collaborate to develop contextualized Environmental Education modules, provide training programs for teachers, and establish monitoring systems that address regional environmental challenges and cultural practices.

Integrate SDG 13 in Curriculum Design and Assessment

To align with the SDG 13 target of improving climate awareness and resilience, educational institutions should incorporate climate change education across all disciplines, not just science-related subjects. Curriculum designers and school administrators should develop competencies and assessments that evaluate students' knowledge, attitudes, and behaviors toward climate action.

Interdisciplinary and experiential learning strategies, such as project-based learning and community engagement, should be institutionalized to promote transformative outcomes.

Adopt the UNESCO ACE Framework to Encourage Participatory and Values-Based Approaches

Educational practices should shift from didactic delivery to participatory and action-oriented learning models as the ACE Framework advocates. Schools should provide platforms for student-led environmental initiatives, community partnerships, and policy simulations that encourage civic engagement and environmental stewardship. Teacher education institutions should integrate ACE principles into pre-service and in-service training to build educators' capacity to facilitate climate empowerment.

Foster Research on Longitudinal and Behavioral Outcomes of EE

Given the existing gap in studies that explore long-term behavioral changes resulting from environmental education, future research should focus on longitudinal studies that track students' environmental actions beyond the classroom. Emphasis should also be placed on mixed-method and participatory research designs to capture the nuanced impact of Environmental Education programs on learners and communities more effectively.

Address Institutional and Cultural Barriers through Inclusive and Contextual Strategies

Institutional inertia, curricular rigidity, and sociocultural barriers must be addressed through inclusive dialogue and multi-stakeholder collaboration. Policymakers, educators, Indigenous communities, religious institutions, and youth organizations should work together to design Environmental Education initiatives that are culturally responsive, ethically grounded, and socially relevant.

Adoption of successful global models of Environmental Education

Some global models have successfully integrated environmentalism into their educational systems. They can be adopted and adapted to provide strategic, scalable, and context-sensitive approaches that can strengthen the implementation

of RA 9512 while also integrating the frameworks of SDG 13 and the ACE Framework.

First, we could incorporate the **Eco-Schools Program of the Foundation for Environmental Education (FEE)**, which is implemented in over 70 European countries and emphasizes a whole-school approach (WSA) to environmental education, focusing on student-led environmental action. By applying this approach, students become empowered to take leadership roles in reducing their carbon footprint while simultaneously incorporating environmental themes across all disciplines (Scott, 2014). Our schools could adopt this approach by introducing eco-projects and initiatives led by students to promote civic responsibility and experiential learning.

Consequently, we can contextualize the **Education for Sustainable Development (ESD) approach**, an approach used in Japan and endorsed by UNESCO. It magnifies the importance of cross-disciplinary learning, systems thinking, and participatory pedagogy (Tilbury, 2011). These same approaches in innovating and integrating sustainability into teacher training modules and curriculum updates in science, social studies, values education, and technology subjects could be adopted by our teachers and curriculum designers.

Additionally, we could study and modify the **place-based and community-integrated models in Environmental Education** that are used in Costa Rica. This program on environmentalism is grounded in students' lived experiences and cultural heritage, emphasizing the importance of sustainability in local contexts (Hamilton & Marckini-Polk, 2023). If systematically and scientifically employed, this contextual approach could enhance the ecological identity and environmental stewardship of Filipino students.

Finally, we could analyze the strengths of the **North American Association for Environmental Education's (NAAEE) Guidelines for Excellence**, a framework that is valuable for designing, implementing, and evaluating environmental education programs in formal settings (Krasny, 2020). These guidelines could lead to the development of clear, age-appropriate, and outcome-based environmental learning standards, especially since the review highlighted inconsistencies in how environmental education is assessed.

These four global models of environmental education magnify the need for participatory, context-sensitive, and competency-driven approaches. We can examine its best features, align them with our existing school practices, and ultimately strengthen the implementation of RA 9512, as guided by SDG 13 and the ACE Framework, thereby preparing our students to become ecologically literate and responsive to the impacts of climate change.

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