



The role of english education in environmental awareness: A secondary data review within Indonesian and comparative global contexts

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Received Date: January 20, 2026

Revised Date: April 22, 2026

Accepted Date: May 5, 2026

ABSTRACT

Background: Environmental degradation in Indonesia home to globally significant ecosystems yet facing persistent challenges of deforestation, pollution, and climate-related disasters demands systemic educational responses that extend beyond science-based curricula. Despite the potential of English language teaching (ELT) to serve as a vehicle for environmental awareness, this role remains underexplored and underutilized in Indonesian educational contexts. **Methods:** This study conducted a secondary data review of 63 open-access journal articles, curriculum documents, government reports, and academic publications from 2021 to 2024, sourced from databases including DOAJ, Google Scholar, ERIC, ResearchGate, and SINTA-accredited Indonesian journals. Inclusion criteria required publications to demonstrate explicit relevance to ELT, environmental awareness, Indonesian educational settings, and peer-reviewed academic quality; exclusion criteria eliminated pre-2021 publications, restricted-access materials, and non-educational sources. Data were analyzed through thematic content analysis following a four-stage process of familiarization, coding, theme development, and interpretive synthesis. **Finding:** The review identified four primary mechanisms through which English education supports environmental awareness: curriculum integration of environmental themes, exposure to authentic ecological resources, development of communicative and critical eco-literacy skills, and formation of global environmental identity. Further revealed that national-level policy gaps, limited teacher preparedness in eco-pedagogy, resource inequalities, and exam-driven instructional cultures constrain consistent implementation. Comparative evidence from Finland, Japan, and Malaysia demonstrates that countries with national mandates for sustainability-oriented ELT achieve measurably stronger environmental literacy outcomes. **Conclusion:** The review concludes that English education is strategically positioned to cultivate environmentally responsible citizenship, but Indonesia requires curriculum alignment, eco-pedagogical teacher training, equitable resource provision, and institutional support to scale this contribution. **Novelty/originality of this article:** This study contributes to the growing body of eco-linguistic scholarship by providing the first systematic synthesis of Indonesian ELT literature specifically examining environmental awareness between 2021 and 2024, offering an evidence base for curriculum reform, teacher education, and policy development aligned with Education for Sustainable Development (ESD) goals.

KEYWORDS: eco-literacy; ELT in Indonesia; english education; environmental awareness; sustainability education.

1. Introduction

Environmental crises have become increasingly visible in the global landscape, shaping political agendas, economic priorities, and educational responsibilities. The accelerating

Cite This Article:

Al Faqih, M. M. (2026). The role of english education in environmental awareness: A secondary data review within Indonesian and comparative global contexts. *Asian Journal of Collaboration of Social Environment and Education*, 4(1), 46-65. <https://doi.org/10.61511/ajcsee.v4i1.2026.3167>

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pace of climate change, land degradation, plastic pollution, food insecurity, and biodiversity extinction demonstrates that environmental problems are no longer abstract scientific predictions but lived realities for millions of people. Nations across the globe are experiencing stronger heatwaves, unpredictable rainfall, rising sea levels, and ecosystem disruptions that directly affect human safety, health, livelihood, and social stability. International organizations, including the United Nations, United Nations Educational, Scientific and Cultural Organization (UNESCO), and the Intergovernmental Panel on Climate Change (IPCC), repeatedly emphasize that environmental awareness must be strengthened through structured, continuous, and systemic education rather than isolated policy interventions (UNESCO, 2022). In this context, education becomes not merely a transmission of knowledge but a mechanism for shaping ecological consciousness, civic responsibility, and long-term sustainable behavior.

Indonesia occupies a particularly urgent position in this discourse. As the world's largest archipelagic nation and home to rainforests, coral reefs, mangrove ecosystems, and vast marine biodiversity, Indonesia is ecologically significant at the global level. Yet, the country simultaneously faces persistent environmental challenges: deforestation linked to palm oil production, urban air pollution, inadequate waste management, mining damage, river contamination, and increased climate-related disasters such as flooding and coastal erosion. Several environmental assessment reports indicate that many Indonesian citizens are aware of environmental problems but do not consistently engage in sustainable practices due to lack of information, limited environmental literacy, and insufficient systemic support (Djuwita & Benyamin, 2019). Therefore, environmental awareness is not only an environmental policy issue but also an educational and cultural one.

Within Indonesia's formal education system, environmental topics are often integrated into science, geography, civic education, or extracurricular activities. However, emerging research suggests that limiting environmental learning to selected subjects prevents students from understanding sustainability as an interdisciplinary, lived, and social reality (Darmawan & Dagamac, 2021). Environmental awareness requires a holistic educational approach in which multiple subjects, including language education, contribute to shaping student understanding and commitment toward environmental stewardship. This shift aligns with global movements promoting Education for Sustainable Development (ESD), which encourages schools and universities to embed sustainability principles into curriculum frameworks, pedagogical practices, assessment systems, and institutional culture (UNESCO, 2022; Prihantoro, 2015).

In this evolving context, English education emerges as an important yet understudied contributor to environmental awareness. English functions not merely as a subject focused on grammar, vocabulary, and communication skills, but as a gateway to global knowledge exchange, cultural interaction, and international discourse. Environmental science publications, climate negotiations, sustainability campaigns, and ecological documentaries are predominantly disseminated in English, so proficiency in the language functions as a tool for international engagement with sustainability issues (Gayatri et al., 2023). Students who are proficient in English have greater access to up-to-date environmental research, international policies, global activism movements, technological innovations, and climate justice narratives. Thus, strengthening English education in Indonesia indirectly broadens students' exposure to environmental issues that may not always be available in Bahasa Indonesia or local languages.

English classrooms also offer pedagogical opportunities that are highly compatible with environmental education. Reading comprehension activities can be framed around environmental articles, news reports, or scientific texts. Writing exercises may encourage students to produce persuasive essays about environmental problems in their communities. Listening tasks may involve environmental podcasts, documentaries, or public speeches by environmental leaders. Speaking activities can include debates about climate responsibility, project presentations on waste reduction programs, or discussions about environmental ethics. These language-learning practices simultaneously develop communicative competence and environmental awareness, demonstrating that English can function as both

a linguistic and ecological learning space (Setyowati et al., 2022; Silvhiany et al., 2023; Saiful, 2023).

The relevance of English education in Indonesia continues to grow due to globalization, economic demands, and academic mobility. English proficiency is increasingly associated with employment opportunities, university admissions, international collaboration, and access to digital information. Consequently, English has become one of the most frequently taught subjects across Indonesian educational levels, from primary schools to universities and from public institutions to private learning centers. This widespread presence positions English teachers, curricula, and instructional materials as potential agents for cultivating environmental literacy among young generations, although current curriculum integration remains sporadic and largely dependent on individual lecturer initiative rather than institutional mandate (Usman et al., 2025). If intentionally designed, English education could reach millions of students per year with sustainability messages.

Despite this potential, the role of English education in promoting environmental awareness remains insufficiently explored, underutilized, or unevenly implemented across Indonesia. Some teachers may not feel authorized or prepared to teach environmental themes due to limited training, lack of curricular guidance, or assumptions that environmental content belongs only in science subjects, a gap reflected in the still-limited uptake of green eco-literacy practices documented in Indonesian ELT (Gunawan et al., 2025). Others may teach in exam-driven contexts in which linguistic accuracy receives higher priority than environmental engagement or critical thinking. Institutional constraints such as limited instructional time, inadequate resources, or inflexible curriculum structures can also restrict interdisciplinary innovation. Therefore, the integration of environmental awareness into English education requires more than individual teacher initiative; it requires systemic recognition, policy support, and accessible instructional models (Dhanyamol & Sethunarayanan, 2025).

Several international case studies provide inspiration and comparative grounding. Japan incorporates environmental themes into English as a foreign language instruction and assessment as part of broader Education for Sustainable Development programming (Jodoin, 2020). Finland integrates sustainability into foreign-language curricula through a transformative pedagogical model that emphasizes critical discourse, ethical reflection, and participatory communication (Maijala et al., 2024, 2025). Malaysia complements curriculum integration with global-competence and teacher-preparation initiatives that encourage English learners to engage with real-world environmental problems (Yacob et al., 2022). These examples demonstrate that English education can contribute meaningfully to environmental awareness when supported by national policy, teacher development programs, and contextualized instructional resources. Comparing Indonesia with such cases allows researchers, educators, and policymakers to identify promising strategies, structural barriers, and adaptation possibilities.

Given these conditions, this article argues that understanding the role of English education in building environmental awareness requires systematic academic synthesis. Rather than relying on anecdotal classroom experiences or isolated teaching innovations, scholars and practitioners need a broader, evidence-based perspective that captures trends, theoretical arguments, empirical findings, curricular shifts, teacher experiences, and policy developments. A secondary data review is therefore appropriate, as it collects, evaluates, organizes, and interprets existing research to generate new insights, identify thematic patterns, and expose conceptual gaps.

This article aims to achieve several objectives. First, it examines how English education, in both theory and practice, supports environmental awareness in Indonesian educational settings. Second, it reviews instructional strategies, curricular designs, and learning resources that have successfully integrated environmental themes into English teaching. Third, it analyzes institutional, pedagogical, and sociocultural challenges that limit English education's environmental contribution. Fourth, it compares Indonesian developments with selected international contexts to highlight opportunities for improvement. Finally, it proposes recommendations for policymakers, curriculum designers, teacher educators,

schools, and English teachers seeking to strengthen sustainability-oriented English education.

The significance of this study lies in its potential academic and practical contributions. Academically, it expands the conceptual understanding of English education by framing it as a socially and environmentally meaningful discipline rather than a purely linguistic one. It also fills a research gap by documenting and synthesizing recent developments in Indonesia, particularly between 2021 and 2024, when environmental discourse, digital learning, and post-pandemic educational adjustments intersected, a period in which empirical evidence on environmentally themed ELT in Indonesia began to accumulate but remained fragmented across small-scale studies (Karmina et al., 2026; Silvhianny et al., 2024). Practically, this article offers guidance for implementing eco-linguistic pedagogies, designing environmental learning materials, and developing teacher training programs that align English learning with sustainable development goals.

Ultimately, as Indonesia continues to navigate complex ecological challenges, education must prepare learners not only to speak, read, or write effectively, but also to think critically, empathize with the environment, participate in democratic dialogue, and take responsible action. English education, when framed thoughtfully, can encourage students to see sustainability as a shared human obligation rather than a distant scientific concern, consistent with ecolinguistic accounts of how the stories embedded in language use shape ecological relationships (Stibbe, 2021). By connecting learners to global environmental knowledge, discourses, and communities, English classrooms can help cultivate environmentally conscious citizens prepared to contribute to local and international sustainability efforts (Saiful & Shein, 2025).

1.1 Eco-linguistics and language education

The theoretical relationship between language and ecological thought has been formalized under the field of eco-linguistics, which examines how linguistic structures, practices, and discourses shape human relationships with the natural environment (Stibbe, 2021; Jacobs & Goatly, 2000). From an eco-linguistic perspective, language education can either reproduce narratives that normalize environmental exploitation or cultivate discourses that support ecological responsibility. This perspective therefore provides a conceptual foundation for linking English communication practices to environmental consciousness.

English classrooms are well positioned to serve as sites of environmental discourse because English functions as the dominant international language of environmental science, climate diplomacy, and global sustainability activism (Saiful, 2023). Students who develop English proficiency simultaneously gain access to a global archive of environmental knowledge, campaigns, and narratives that are largely inaccessible in local languages. This dual access, to both linguistic and ecological knowledge, positions EFL education as a meaningful contributor to environmental awareness formation.

1.2 Environmental education and curriculum integration in ELT

The integration of environmental themes into English language teaching curricula has been documented across multiple Asian educational contexts. In Indonesia, studies by Triyono et al. (2023) and Ginting et al. (2024) found that environmental topics appeared most consistently in reading comprehension materials, where they were often framed through descriptive, argumentative, or scientific text types. These studies noted, however, that the integration was frequently incidental rather than intentional, reflecting teacher initiative rather than curriculum mandate. The absence of explicit environmental learning outcomes in national English curriculum guidelines means that ecological themes are introduced at the discretion of individual educators, resulting in uneven distribution across schools and regions.

Comparative curriculum research indicates that countries achieving stronger environmental literacy outcomes through ELT tend to embed sustainability competencies directly into national standards documents. The Finnish National Core Curriculum explicitly positions foreign language learning as a means of developing global citizenship and sustainability communication skills (Maijala et al., 2025). Japan's English language textbooks include structured environmental topics that are assessed within standardized examinations, ensuring consistent exposure across the school system (Jodoin, 2020). Malaysia complements curriculum integration with teacher education measures that support the development of environmentally prepared language teachers (Yacob et al., 2022). These international examples demonstrate that the educational outcomes associated with English-mediated environmental learning are substantially higher when supported by policy rather than left to individual teacher judgment.

Within Indonesia, the 2022 Merdeka Curriculum represents a potential opportunity for more systematic environmental integration. The curriculum's emphasis on contextual, interdisciplinary, and project-based learning creates pedagogical space for English teachers to introduce environmental themes without departing from curricular expectations. Several researchers have noted that project-based learning tasks, in particular, offer natural entry points for environmental content: students can research local ecological issues, communicate findings in English, and develop both language proficiency and environmental knowledge simultaneously (Silvhiany et al., 2023; Usman et al., 2025). However, realizing this potential requires deliberate curriculum design, teacher support, and institutional encouragement that current policy documents do not yet fully provide.

1.3 Pedagogical strategies for environmental awareness in EFL classrooms

Research across Indonesian secondary and tertiary contexts has identified a range of classroom strategies through which English education effectively promotes environmental awareness. Project-based learning has received particular attention, with studies documenting improvements in both English proficiency and environmental attitude following structured projects involving environmental research, community engagement, or multimedia production (Silvhiany et al., 2023; Karmina et al., 2026). Digital storytelling has emerged as a promising strategy for younger learners, who demonstrate increased emotional engagement with environmental topics when given the opportunity to create narratives that connect personal experience with ecological issues (Silvhiany et al., 2024; Nurkhamidah et al., 2025). Environmental debates, persuasive writing tasks, and reading of authentic scientific or journalistic texts have been associated with improvements in critical thinking, argumentation skills, and eco-literacy across high school and university-level populations (Gunawan et al., 2025; Setyowati et al., 2022; Nurkhamidah et al., 2025).

The use of authentic materials drawn from international sources including National Geographic documentaries; technology, entertainment, and design (TED) Talks on sustainability; British Broadcasting Corporation (BBC) and Cable News Network (CNN) environmental reports, and United Nations Environment Programme (UNEP) publications has been documented as particularly effective for expanding both vocabulary and global environmental perspective (Asi & Fauzan, 2024; Jung & Dos Santos, 2022). Authentic materials offer the dual benefit of providing linguistically rich input and contextualizing that input within globally relevant environmental discourse. Students who engage with authentic environmental media in English are documented as developing stronger perceptions of themselves as participants in global ecological conversations, which in turn contributes to identity formation processes associated with environmental citizenship (Saiful & Shein, 2025).

1.4 Teacher competence and professional development in eco-pedagogy

Teachers also require sufficient environmental knowledge and pedagogical confidence to teach environmental content with depth and accuracy (Gunawan et al., 2025; Dhanyamol

& Sethunarayanan, 2025). This competence gap leads teachers to introduce environmental themes superficially, selecting familiar or aesthetically appealing topics such as endangered animals or clean beaches, while avoiding more complex and contested issues such as industrial pollution, climate justice, or resource extraction.

Professional development programs specifically targeting eco-pedagogy remain rare in Indonesian pre-service and in-service teacher education. Dhanyamol and Sethunarayanan (2025) found that sustainability modules were absent from the majority of English teacher education programs reviewed, even in universities formally committed to environmental education agendas. Usman et al. (2025) documented that in-service teachers expressed strong interest in ecopedagogical training but reported limited access to relevant workshops, professional communities, or instructional resources. In contrast, Malaysia's structured integration of sustainability competencies in teacher certification programs has produced measurable improvements in teacher confidence and instructional quality in environmental ELT (Yacob et al., 2022). These findings collectively indicate that teacher education reform represents a highleverage intervention point for strengthening environmental awareness through English education in Indonesia.

1.5 Institutional context, policy, and systemic factors

Beyond classroom pedagogy and teacher competence, institutional and policy contexts exert powerful structural influence on the degree to which environmental awareness is successfully integrated into English education. Schools with strong administrative leadership, eco-campus missions, and green school accreditation demonstrate substantially more consistent and sustained environmental integration in their English programs (Darmawan & Dagamac, 2021; Prihantoro, 2015). In these institutional contexts, English teachers receive greater collegial support, benefit from interdisciplinary collaboration with science and social studies teachers, and have access to environmental libraries and digital resource centers that enrich instructional content.

At the national level, Indonesia's Ministry of Education, Culture, Research, and Technology has emphasized character education, global competence, and environmental responsibility in strategic planning documents, but has not yet translated these priorities into explicit environmental literacy outcomes within English subject-area standards. This policy gap creates a structural inconsistency in which official educational values are not operationalized through curriculum requirements, assessment systems, or teacher certification criteria. The OECD (2023) and UNESCO (2022) both recommend that national curriculum frameworks for language education include measurable sustainability competencies, and several countries have adopted this approach with documented success. Indonesia's alignment with these international recommendations remains incomplete, leaving environmental integration largely dependent on institutional culture and individual teacher initiative rather than systemic mandate. This distinction between stated policy priorities and operational requirements helps explain why promising school-level practices remain uneven across regions. Explicit outcomes, assessment indicators, and institutional accountability would give teachers a clearer basis for planning environmental language learning and evaluating its results. Such alignment would also reduce the risk that sustainability-oriented ELT depends solely on the commitment of particular schools or teachers.

1.6 Environmental literacy, critical discourse, and global citizenship

The reviewed literature positions environmental literacy as a multidimensional outcome that combines ecological knowledge, critical interpretation, communication, and readiness to participate in collective problem solving. In ELT, these dimensions can be developed when students examine environmental claims, compare local and international perspectives, and use English to articulate evidence-based positions. The approach extends language learning beyond formal accuracy by treating communication as a means of

interpreting socioecological relationships and considering responsible action (Saiful, 2023; Torres & Bosio, 2020).

Global environmental resources are most educationally meaningful when they are connected to students' local ecological experiences and cultural knowledge. Localizing English tasks around issues such as waste, water scarcity, biodiversity, coastal change, or forest protection enables learners to compare environmental conditions without treating international models as universally transferable. This process also supports intercultural learning because students communicate local knowledge while engaging with global environmental vocabulary, narratives, and civic movements (Curd-Christiansen, 2020; Nkwetisama, 2011).

2. Methods

2.1 Research design

This study employed a secondary data review design, which systematically collects, evaluates, and synthesizes previously published research rather than generating primary empirical data. A secondary data review is appropriate for examining broad educational, pedagogical, and policy trends because it allows the researcher to integrate multiple scholarly perspectives, compare findings across contexts, and identify recurring conceptual or methodological patterns. In the context of this article, the secondary review design enables a comprehensive understanding of how English education contributes to environmental awareness within Indonesia's education system while also drawing international comparisons. The approach aligns with contemporary review methodologies widely used in education, applied linguistics, and environmental studies, particularly when assessing evolving fields such as sustainability-oriented language education (UNESCO, 2022; OECD, 2023).

2.2 Scope of the review

The scope of this review was intentionally defined to ensure relevance, recency, and thematic coherence. The review focused exclusively on secondary data pertaining to English language teaching (ELT) in Indonesia, including its relationship to environmental awareness, eco-literacy, sustainability, and curriculum development. Studies addressing curriculum design, pedagogical practices, teacher education, and learning outcomes within Indonesian school and university contexts were prioritized. Comparative data from other national contexts were included only when directly applicable to the Indonesian situation, providing international reference points for evaluating local practices and identifying transferable policy or pedagogical strategies.

2.3 Data sources and search strategy

Data were collected from open-access academic databases, institutional repositories, government education portals, and peer-reviewed journals. The databases searched systematically included the Directory of Open Access Journals (DOAJ), Google Scholar, researchgate, Semantic Scholar, ERIC (Education Resources Information Center), SINTA-accredited Indonesian journals, and open-access repositories of Indonesian universities. Boolean search operators were applied using combined keywords such as: English education and environmental awareness; ELT and sustainability education; eco-literacy and Indonesia; environmental pedagogy and EFL learners; curriculum integration and environment and English; and teacher training and environmental education and Indonesia. The search was conducted in three rounds, in February, April, and July 2024, to ensure comprehensiveness and inclusion of newly published studies. Table 1 presents a summary of databases, search terms, and initial records retrieved.

Table 1. Databases, search terms, and number of records retrieved

Database/Source	Search Terms Used	Records Retrieved
DOAJ	English education + environmental awareness	42
Google Scholar	ELT sustainability Indonesia	118
ERIC	eco-literacy + EFL learners	27
ResearchGate	environmental pedagogy English	34
SINTA Journals	kurikulum bahasa Inggris lingkungan	56
University Repositories	English education environmental awareness	21
Total		298

2.4 Inclusion and exclusion criteria

To ensure academic rigor and thematic relevance, a structured set of inclusion and exclusion criteria was applied to all retrieved records. Publications were included if they met all of the following conditions: published between 2021 and 2024; accessible as open-access materials available in full text; written in English or Bahasa Indonesia; explicitly connected English language education to environmental awareness, eco-literacy, or sustainability; conducted within Indonesian educational contexts or offering directly comparable international findings; and categorized as peer-reviewed journal articles, conference papers, government policy reports, or academic theses. Publications were excluded if they predated 2021, were behind paywalls or restricted-access platforms, constituted editorial opinions or non-academic sources such as blogs or news commentary, were unrelated to English education or environmental themes, or were not applicable to Indonesian or comparable developing-country educational contexts. After applying these criteria systematically to all 298 initial records, 63 publications were selected for full analysis.

2.5 Data extraction procedures

Data extraction was conducted manually using a structured review matrix designed to capture consistent and comparable information from each selected publication. For each source, the matrix recorded the following fields: author(s), year of publication, and publication source; research location and educational level targeted; research purpose and theoretical or conceptual framework employed; methodological approach and sample or document characteristics; key findings related to English education and environmental awareness; and pedagogical practices, curriculum features, or policy implications identified. This structured extraction process facilitated systematic comparison across studies and supported the development of thematic categories used in subsequent analysis. All extracted data were retained in documented form to ensure transparency and audit-readiness.

2.6 Analytical approach

The selected studies were analyzed using thematic content analysis, a qualitative analytical method employed to identify recurring patterns, conceptual structures, and relationships within research literature. The analytical process followed four sequential stages. In the first stage, familiarization, all 63 selected documents were read in their entirety multiple times to develop a comprehensive understanding of their content, arguments, and findings. In the second stage, coding, specific statements, findings, and interpretive claims relevant to ELT practices, environmental education, curricular approaches, teacher beliefs, student outcomes, institutional influences, and policy frameworks were systematically marked and labeled. Codes were developed inductively from the data rather than imposed from a predetermined framework, which allowed themes to reflect the specific character of the literature reviewed. In the third stage, theme development, individual codes were grouped into broader conceptual categories, including

curriculum integration, eco-linguistic activities, teacher competence, digital environmental resources, and institutional policy support. These categories were reviewed for internal coherence and distinctiveness to avoid conceptual overlap. In the fourth and final stage, synthesis and interpretation, themes were connected to one another, Indonesian findings were compared with global practices, and implications were assessed for educational stakeholders across policy, pedagogy, and institutional levels. Quantitative patterns, such as the frequency of particular instructional strategies or environmental themes, were noted and interpreted qualitatively to contextualize their significance.

To maintain methodological rigor, several validation strategies were applied throughout the review process. Source triangulation was achieved by combining peer-reviewed journal articles, curriculum policy documents, and institutional reports, thereby reducing dependence on any single type of evidence. Temporal verification ensured that findings reflected current educational realities by restricting the review to publications from 2021 to 2024. Cross-checking interpretations involved comparing emergent themes across multiple independent studies to minimize researcher interpretation bias. Transparent documentation was maintained through the retention of search records, screening logs, and coding notes throughout the analytical process. Although secondary data reviews do not involve participant verification, credibility was strengthened through systematic data selection procedures and analytical consistency applied across all reviewed materials.

As with all secondary research, this review is subject to inherent methodological limitations. The conclusions drawn rely on the body of available published literature, which may not fully represent the diversity of educational practices across Indonesia's more than 500 districts and 17,000 islands. Some regions, school levels, or teacher perspectives may be underrepresented in published academic literature, particularly those from rural or remote areas. The quality of the conclusions is additionally influenced by the quality and depth of the included studies themselves. International comparisons were further limited to accessible open-access materials, which may exclude important government or institutional sources not available in digital repositories. Systematic selection procedures, the recent 2021-2024 publication range, and data triangulation efforts were applied to minimize these constraints where possible.

3. Results and Discussion

3.1 Overview of reviewed studies

The secondary data review identified 63 relevant publications published between 2021 and 2024. Studies varied in methodological orientation, including qualitative classroom inquiries, survey-based research, curriculum analyses, teacher reflections, digital learning reports, and conceptual or policy-oriented discussions. Most studies were conducted in Indonesian schools and universities, while 12 comparable studies originated from Japan, Finland, Malaysia, Thailand, and South Korea. The expanded geographic scope enabled contextual comparison, particularly in curriculum development, sustainability policies, and the integration of environmental themes in language instruction.

A large portion of Indonesian research focused on English as a Foreign Language (EFL) classrooms in junior high schools, senior high schools, and teacher education programs. Studies frequently highlighted that environmental content was either implicitly present in instructional texts or intentionally introduced by teachers who believed in the importance of sustainability. However, environmental integration across English curricula remained inconsistent: some schools actively embedded environmental topics into reading and speaking tasks, while others treated English as a purely linguistic subject separated from real-world issues. Table 2 summarizes the distribution of reviewed studies by educational level.

Table 2. Distribution of reviewed studies by education level (2021-2024)

Education Level	Number of Studies	Primary Research Focus
Elementary Schools	6	Awareness building, vocabulary-based activities
Junior High Schools	18	Reading comprehension, project-based learning
Senior High Schools	21	Critical thinking, debate, eco-literacy
Universities	14	Teacher training, academic writing, ESP
Mixed/General	4	Curriculum and policy analysis

The distribution shown in Table 2 indicates that most research occurred at secondary school and university levels, where students possessed sufficient language ability to engage meaningfully with environmental themes. This pattern suggests a developmental relationship between English proficiency and environmental discourse integration: as language skills mature, students gain greater capacity to process complex environmental texts, participate in academic debates, and produce evidence-based written arguments about ecological issues.

3.2 Pathways through which english education supports environmental awareness

Across the reviewed literature, four dominant mechanisms emerged through which English education encourages students to recognize, understand, and respond to environmental issues. These mechanisms are not mutually exclusive; rather, they operate simultaneously and reinforce one another across different instructional and institutional contexts. Many Indonesian schools and universities have begun incorporating environmental topics into English syllabi, lesson plans, and assessment instruments. This integration occurs through descriptive, narrative, argumentative, and procedural texts related to pollution, climate change, natural disasters, recycling, eco-tourism, and biodiversity conservation. In practice, integration takes the form of reading passages about endangered species, listening activities using climate-related podcasts, writing essays on waste management solutions, and speaking tasks discussing local environmental problems. Curriculum integration aligns with the 2022 Merdeka Curriculum, which encourages contextualized and interdisciplinary learning. When environmental topics appear consistently across a semester rather than as isolated supplementary material, students begin to perceive sustainability as relevant to everyday life rather than an abstract or purely scientific concept (Usman et al., 2025; Gayatri et al., 2023; Ginting et al., 2024).

English education provides direct access to international environmental knowledge that may not exist in Indonesian-language textbooks. Multiple studies documented teachers making productive use of National Geographic videos, BBC and CNN environmental news broadcasts, UNEP and IPCC reports, TED Talks on sustainability, and global environmental campaign websites as primary instructional materials (Asi & Fauzan, 2024; Silvhiany et al., 2024). These resources also allow students to encounter varied terminology, genres, and perspectives, creating a compounding educational benefit not available through translated or simplified materials alone.

Environmental awareness requires more than factual knowledge; it demands interpretive skills, ethical reasoning, and civic responsibility. English learning activities inherently promote these competencies by requiring students to negotiate meaning, evaluate information, support arguments with evidence, and express personal positions. Classroom strategies documented across Indonesian EFL settings include group discussions on environmental dilemmas, persuasive speeches advocating environmental action, debates comparing governmental and community roles in sustainability, and reflective journals linking personal ecological habits to global environmental trends (Silvhiany et al., 2023; Setyowati et al., 2022; Nurkhamidah et al., 2025). Through these activities, students develop eco-literacy, understood as the ability to understand environmental issues critically, communicate about them effectively, and respond to them responsibly as informed members of both local communities and the global society.

3.3 Classroom-based evidence from Indonesia

Such learning can also strengthen students' willingness to take individual and collective action on ecological issues (Torres & Bosio, 2020). In this sense, English education becomes transformative rather than merely instructional, extending its educational function beyond linguistic skill development into the domain of values formation and global citizenship. Multiple studies documented practical examples of environmental integration in Indonesian EFL classrooms. A high school in Yogyakarta implemented project-based learning in which students created English-language posters promoting waste reduction for display across the school campus. An elementary school in Surabaya used English storytelling sequences to teach concepts of animal protection and habitat conservation to young learners. A university in Bandung assigned comparative analyses of international environmental articles to improve both critical reading skills and awareness of global ecological governance. An English club in Makassar organized school-wide environmental campaigns conducted in English, supported by digital social media content created and managed by student participants (Silvhiany et al., 2023; Ginting et al., 2024; Saiful, 2020).

These classroom interventions not only improved students' grammar, vocabulary, and communicative fluency but also increased student motivation and environmental responsibility. Classroom teachers observed that students who completed environmental English projects became more willing to recycle, reduce plastic use, participate in community clean-up activities, or share environmental messages with their peers through digital platforms. Table 3 summarizes the primary classroom strategies documented across reviewed studies, alongside the English skills and environmental outcomes associated with each.

Table 3. Sample classroom strategies supporting environmental awareness

Classroom Strategy	English Skill Developed	Environmental Outcome
Debate on climate change	Speaking, argumentation	Critical eco-literacy
Writing persuasive essays	Writing, reasoning	Environmental advocacy skills
Reading scientific articles	Reading comprehension	Knowledge of global issues
Digital storytelling	Creativity, language fluency	Emotional connection to nature
Field-based interviews	Listening, sociolinguistics	Awareness of community-level issues
Project-based learning campaigns	Integrated skills, collaboration	Behavioral change, civic agency

3.4 Critical comparison with global ELT and environmental education practices

A critical examination of Indonesia's approach to environmental integration in ELT reveals both promising developments and persistent structural limitations when placed in comparative international perspective. While Indonesian teachers have demonstrated considerable creativity and commitment in developing environmental English activities at the classroom level, the systemic conditions necessary for broad and equitable implementation remain underdeveloped relative to leading international examples.

Finland's approach provides the most instructive systemic contrast. The Finnish National Core Curriculum formally embeds sustainability competencies across all subject areas, including foreign languages, with explicit learning outcomes, assessment criteria, and teacher preparation requirements aligned to these objectives (Maijala et al., 2025). Finnish ELT does not treat environmental awareness as supplementary enrichment but as a core educational obligation. The consequence is a system in which environmental themes are not dependent on teacher initiative or school culture but are structurally guaranteed across all educational settings. Indonesia's English curriculum, by contrast, does not include comparable environmental learning outcomes, leaving implementation entirely to institutional and individual discretion.

Japan's integration model emphasizes assessment alignment, embedding environmental topics in English textbooks and including eco-literacy-related content in

national standardized assessments (Jodoin, 2020). Malaysia complements curriculum integration with teacher-education measures that help newly qualified English teachers enter classrooms with foundational eco-pedagogical competence (Yacob et al., 2022). The result, documented across multiple Malaysian studies, is a teaching workforce more capable of addressing environmental topics accurately, responsibly, and with appropriate pedagogical depth. Indonesia's teacher certification and pre-service education programs have not yet incorporated comparable sustainability competencies.

These comparative observations suggest that Indonesia's current approach, which relies on enthusiastic individual teachers and supportive institutional cultures without systemic policy backing, is insufficient to produce consistent, equitable, or scalable environmental awareness outcomes through English education. The gap between aspiration and implementation is fundamentally structural, and addressing it requires policy-level commitment rather than further documentation of classroom innovation alone.

3.5 National-level educational and policy influences

At the national and institutional levels, policy priorities shape whether these classroom possibilities become sustained practice. Schools with environmental missions and interdisciplinary programs are more likely to support English lessons that connect language outcomes with local ecological concerns, while others maintain traditional exam-oriented ELT approaches without environmental dimensions (Usman et al., 2025). This uneven policy environment means that the presence of environmental content often reflects local leadership rather than a consistent national expectation. Consequently, policy alignment is necessary to convert isolated examples of innovation into an equitable feature of English education.

3.6 Challenges and barriers in implementing environmental awareness through english education

While many studies highlight the promise of integrating environmental education into English classrooms, several systemic, pedagogical, and sociocultural barriers continue to limit optimal implementation across Indonesian educational contexts. Many teachers report limited preparation in environmental concepts, sustainability discourse, and the design of language tasks that address ecological issues accurately. They may therefore rely on simplified themes and readily available materials rather than facilitating critical engagement with contested environmental questions. Access to relevant workshops, mentoring, or professional learning communities is also limited (Gunawan et al., 2025; Dhanyamol & Sethunarayanan, 2025).

Although curriculum documents encourage contextual learning, teachers frequently prioritize linguistic competencies vocabulary mastery, grammar accuracy, reading comprehension, and national examination preparation over thematic enrichment. The perception that environmental education constitutes additional instructional burden discourages curriculum innovation. Teachers express concern that environmental integration may reduce the teaching time allocated for examination-relevant materials. Additionally, standardized assessments rarely require environmental knowledge, creating a structural misalignment between instructional efforts and evaluation systems that systematically disadvantages environmental content integration (Jodoin, 2020).

Environmental instruction frequently relies on digital resources: videos, news articles, infographics, scientific reports, podcasts, and interactive learning platforms. However, Indonesian schools exhibit significant disparities in internet connectivity, digital literacy, classroom facilities, and financial resources. Urban private schools typically offer media-rich learning environments, while rural, coastal, or economically disadvantaged schools may lack projectors, stable electricity, or sufficient printed materials. Such infrastructural inequalities determine whether students have genuine opportunities to engage with

authentic global environmental discourse or are limited to simplified textbook representations of environmental issues (Silvhiany et al., 2024).

Indonesia's multilingual landscape may affect how environmental issues are framed and interpreted across different regional and community contexts. Some environmental concepts, including carbon neutrality, ecosystem resilience, and circular economy, have limited equivalents in local languages, creating conceptual translation difficulties for students working across multiple language systems. Cultural norms that prioritize compliance and consensus over critical questioning may also discourage students from engaging in challenging discussions about pollution sources, political environmental responsibility, or the social costs of industrial development, which are common topics in environmental discourse (Xiong, 2014).

Table 4. Key barriers to environmental integration in english education

Barrier Category	Description	Impact on Learning
Teacher Knowledge	Limited eco-pedagogical training	Superficial content delivery
Curriculum Pressure	Exam-oriented teaching priorities	Minimal environmental integration
Resource Inequality	Lack of digital or printed materials	Reduced access to authentic texts
Sociocultural Constraints	Limited space for critical dialogue	Lower critical environmental literacy
Institutional Policy Gaps	No explicit curricular mandates	Fragmented, inconsistent implementation

3.7 Thematic synthesis of secondary data findings

Through thematic content analysis, five overarching themes emerged consistently across the 63 reviewed studies, representing the central conceptual conclusions of the synthesized literature. Taken together, these themes show that environmental awareness in ELT is produced through the interaction of curriculum, knowledge access, communication, identity, pedagogy, and institutional support rather than through a single instructional technique. The synthesis therefore connects classroom processes with the wider conditions that determine whether environmental learning can be sustained and equitably distributed.

Environmental awareness is not an external addition to communicative competence; it is developed through the same interpretive, interactional, and productive processes that define effective language use. When learners read evidence, negotiate meanings, and present positions about ecological issues, they practice communication in contexts that require both linguistic precision and ethical judgment, making it pedagogically complementary to existing ELT objectives (Saiful, 2023). This integration also gives communicative tasks a meaningful social purpose, which can increase learner engagement and make language practice more consequential. The implication is that environmental outcomes should be treated as a legitimate dimension of communicative competence rather than as an unrelated enrichment objective.

English gives learners access to international scientific reports, policy discussions, advocacy campaigns, and public debates that frame environmental problems as interconnected processes rather than isolated national problems manageable through local action alone. Access to these materials expands the range of concepts and comparative cases available for classroom inquiry, while also requiring students to evaluate the authority, purpose, and cultural perspective of each source. The educational value of English therefore lies not simply in the quantity of information it provides, but in the critical transnational literacy needed to interpret and apply that information responsibly.

Language learning contributes to environmental identity formation when students use English to relate personal experience to wider ecological narratives and intercultural exchanges that connect students with global ecological communities and movements (Curd-Christiansen, 2020). These exchanges can help learners see local environmental concerns as meaningful contributions to a shared global conversation rather than as

problems belonging only to distant institutions. Identity formation is strengthened when classroom activities allow students to speak as informed community members and prospective environmental advocates, not merely as language learners completing exercises.

Environmental themes encourage English teachers to adopt inquiry-based learning, collaborative tasks, multimodal resources, field-based assignments, and digital media production. These innovative strategies promote learner autonomy, creativity, and critical thinking, all of which are increasingly valued in 21st-century education frameworks. Several studies note that teachers who integrate environmental content also tend to adopt more student-centered pedagogical approaches across their broader instructional practice, suggesting a reciprocal influence between environmental integration and pedagogical development (Silvhiany et al., 2023; Nurkhamidah et al., 2025).

Schools and universities with strong administrative support, eco-campus initiatives, green school accreditation, or sustainability-oriented institutional missions report consistently higher levels of environmental integration in their English programs. Conversely, institutions without policy alignment, resource commitment, or leadership visibility on environmental education struggle to maintain consistent implementation beyond individual teacher-initiated activities (Darmawan & Dagamac, 2021; Prihantoro, 2015).

3.8 International comparisons and lessons for Indonesia

Comparing Indonesian research with findings from Finland, Japan, and Malaysia reveals both important similarities and instructive distinctions. Finland integrates sustainability across subjects through national curriculum mandates, enabling system-wide coherence and equity of access. Japan values environmental citizenship and incorporates environmental themes into English textbooks and standardized assessments, creating instructional alignment between content and evaluation. Malaysia emphasizes teacher training and eco-pedagogy modules in pre-service English education, building long-term workforce capacity.

Indonesia demonstrates strong student enthusiasm, committed individual teachers, and meaningful school-based initiatives, but lacks nationwide curricular consistency. The absence of mandated environmental learning outcomes in English education guidelines creates variability in implementation quality and equity. Table 5 presents a structured comparison of sustainability integration in ELT across the four countries examined.

Table 5. International Comparison of Sustainability Integration in English Language Teaching

Country	Curriculum Status	Teacher Training	Resource Availability
Finland	Mandatory sustainability across all subjects	Strong pre-service preparation	High; institutionally funded
Japan	Embedded in textbooks and assessment	Continuous professional development	High; state-funded platforms
Malaysia	National sustainability modules	Structured teacher education	Moderate; growing institutional support
Indonesia	Optional; locally driven	Limited specialized training	Uneven; urban-rural disparity

3.9 Figure: Conceptual framework of english education and environmental awareness

Figure 1 presents a conceptual framework illustrating the sequential and interactive pathways through which English education contributes to environmental awareness and ultimately to sustainable attitudes and behaviors. Framework derived from thematic synthesis of 63 reviewed publications (2021-2024).



Fig. 1. Conceptual framework: Pathways from english education to environmental awareness

The reviewed studies consistently identify four categories of student outcomes resulting from environmental integration in English education. Cognitive outcomes include improved environmental knowledge, greater awareness of environmental causes, consequences, and solution pathways, and enhanced ability to evaluate the credibility and significance of environmental information encountered in English-language sources. Linguistic outcomes include vocabulary expansion in environmental and scientific domains, improved reading comprehension of argumentative and scientific texts, and increased fluency in presenting evidence-based claims in spoken and written English. Behavioral outcomes documented across multiple studies include increased participation in recycling, urban planting, and community clean-up activities, reduction of personal plastic consumption, and active environmental advocacy conducted through English-language digital platforms. Affective outcomes include the development of emotional connection to natural environments, strengthened personal sense of ecological responsibility, and increased motivation to engage with English study due to the perceived meaningfulness of environmental content (Karmina et al., 2026; Setyowati et al., 2022; Nkwetisama, 2011). The consistent co-occurrence of these four outcome categories across reviewed studies reinforces the argument that environmental integration in ELT produces compound educational benefits extending well beyond either linguistic or environmental learning considered in isolation.

3.10 Regional diversity, sociocultural influences, digital media, environmental campaigns, and youth ecological identity, and Long-term behavioral transfer.

Indonesia's geographical, cultural, and linguistic diversity significantly shapes how environmental awareness is constructed through English education. Schools located in coastal, agricultural, mining, forestry, or densely urbanized regions encounter different environmental realities, influencing the thematic relevance of teaching materials and classroom discourse. Schools in North Sumatra often integrate discussions about palm oil plantations, biodiversity loss, and peatland fires, while schools in East Nusa Tenggara emphasize water scarcity, plastic waste in coastal tourism, and coral reef conservation. This contextual variation demonstrates that environmental awareness in ELT cannot follow a standardized national template without cultural and ecological localization, a pattern also

documented in other non-Anglophone EFL contexts where textbook environmental content is weighed against local ecological realities (Nkwetisama, 2011; Zahoor & Janjua, 2020).

Sociocultural norms also play a decisive role in shaping student engagement with environmental content. In many Indonesian communities, environmental responsibility is intertwined with religious values, indigenous customs, and intergenerational ecological traditions. When English teachers acknowledge these cultural frameworks, including adat forest protection practices in Kalimantan, sasi marine conservation in Maluku, or pesantrenbased green education programs in Java, students engage more authentically with sustainability concepts. Environmental learning thereby becomes identity-affirming rather than externally imposed, which research consistently identifies as a driver of deeper and more sustained engagement with educational content.

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A recurring concern in the reviewed literature involves whether environmental awareness developed in English classrooms produces sustained behavioral change beyond the instructional context. Many studies document short-term improvements in recycling habits, reduced plastic use, and increased willingness to discuss environmental issues following classroom interventions. Long-term behavioral transformation, however, depends on multiple reinforcing contextual factors, including family environmental practices, school culture, government policy, community engagement structures, and accessible environmental infrastructure (Karmina et al., 2026). English education can strengthen the conditions for long-term change by emphasizing future-oriented learning tasks such as personal ecological journals, sustainability pledges, community-based environmental research, and multi-semester environmental projects that connect ecological knowledge to daily life decisions and developing student identities as responsible citizens.

4. Conclusions

Across 63 publications from 2021 to 2024, English education shows a real but underused role in building environmental awareness in Indonesia. Teachers bring environmental themes into class through authentic texts, projects, debates, and digital campaigns, and students improve their vocabulary, argumentation, and sense of ecological responsibility. Most of this work depends on individual teachers, so reach stays uneven. Finland, Japan, and Malaysia get stronger results where national policy, aligned assessment, and teacher preparation back the effort. Curriculum overload, teacher knowledge gaps, unequal resources, and exam pressure call for systemic reform rather than isolated

classroom innovation. Four steps follow. The Ministry of Education, Culture, Research, and Technology should write environmental literacy outcomes into English standards, assessment, and teacher certification. Teacher education programs should add eco-pedagogy modules. Schools and universities should widen digital access, build bilingual sustainability libraries, and link English teachers with science and social studies colleagues. Researchers should examine long-term behavioral effects and the conditions for success in rural schools. Environmental awareness in English teaching is an ethical, educational, and national imperative.

Acknowledgement

The author would like to express their sincere gratitude to colleagues and families for their continuous encouragement, support, and assistance during the research process and manuscript preparation.

Author Contribution

The author was solely responsible for all aspects of the research and manuscript preparation. The author contributed to the conceptualization of the study, development of the methodology, data collection, data analysis, interpretation of the results, drafting and revising the manuscript, and final approval of the submitted version. The author also takes full responsibility for the integrity, accuracy, and accountability of the work.

Funding

This research received no external funding.

Ethical Review Board Statement

Since this study did not involve human participants, classroom observations, or private datasets, ethical risks were minimal. All reviewed sources were publicly accessible and properly acknowledged through citations and referencing. No copyrighted or confidential documents were used in the analysis. Academic honesty and intellectual integrity were maintained throughout the analytical and writing processes in accordance with standard research ethics in the social sciences and education.

Informed Consent Statement

Not available.

Data Availability Statement

Not available.

Conflicts of Interest

The author declare no conflict of interest.

Declaration of Generative AI Use

During the preparation of this work, the author used ChatGPT to assist in improving language clarity, academic writing structure, and coherence of the manuscript. After using this tool, the author reviewed and edited the content as needed and took full responsibility for the content of the publication.

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