

ENHANCING STUDENTS' ECOLOGICAL LITERACY THROUGH PLACE-BASED PEDAGOGY IN INDONESIAN EFL CLASSROOMS

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Article Info	Abstract
Article History Received: April 2026 Revised: May 2026 Accepted: June 2026 Published: July 2026	<i>Ecological literacy has emerged as a critical competency in the face of growing environmental challenges, yet English language instruction in many Indonesian EFL contexts continues to address ecological issues in decontextualized and abstract ways. Previous studies on place-based pedagogy (PBP) have largely concentrated on science education or Western school settings, leaving a significant empirical gap regarding its application in Indonesian secondary EFL classrooms. This study examined how place-based pedagogy enhances Grade XI students' ecological literacy at senior high schools Palembang, South Sumatra, within a Participatory Action Research (PAR) framework. A mixed-methods design was employed involving 35 Grade XI students and one English teacher across eight instructional meetings. Quantitative data were collected through pre-test and post-test instruments measuring students' reading ecological literacy and ecological knowledge, and analyzed using paired-sample t-tests. Qualitative data were gathered through classroom observations and semi-structured interviews with nine selected students and the English teacher, and analyzed thematically following Braun and Clarke's (2006) framework. Results revealed statistically significant improvements in both reading ecological literacy ($t(34) = -18.71, p < .001$) and ecological knowledge ($t(34) = -22.54, p < .001$). Thematic analysis identified four student-centred mechanisms: real-life relevance, emotional engagement, improved ecological understanding, and active participation. Teacher findings demonstrated that collaborative PAR processes supported professional development, enabling the teacher to independently incorporate environmental themes into formal examinations in the subsequent academic year. This study concludes that place-based pedagogy constitutes an effective and contextually responsive approach for integrating ecological literacy into EFL instruction at the secondary school level in Indonesia.</i>
Keywords Place-based pedagogy; Ecological literacy; Participatory action research; EFL classroom; Environmental education:	
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INTRODUCTION

Students today grow up surrounded by environmental problems, floods that disrupt their daily lives, plastic waste piling up in school canteens, and air thick with vehicle emissions on their way to school. Yet despite this daily reality, many Indonesian EFL classrooms continue to teach environmental topics as though they exist only in textbooks, far removed from students' lived experiences. This disconnect raises an important question: how can English language learning become a space where students not only read about environmental issues, but genuinely understand them? Addressing this question requires rethinking how ecological

literacy is developed in EFL settings. According to McBride et al. (2013), ecological literacy equips learners with the knowledge and tools needed to make informed, responsible decisions by fostering understanding of natural systems and the interdependence between human activity and ecological processes. Despite this imperative, students in developing countries including Indonesia, continue to demonstrate limited ecological awareness, and academic curricula frequently address environmental issues only within theoretical and decontextualized frameworks (Eliyawati et al., 2023; Hassan & Ismail, 2011).

In the context of English language teaching (ELT), ecological literacy and sustainability education have increasingly been integrated to support both language development and environmental awareness. Recent studies in Indonesian EFL settings demonstrate that English classrooms can serve as effective spaces for promoting students' awareness of the Sustainable Development Goals (SDGs) through meaningful, locally grounded learning materials (Silvhiyani et al., 2023; Hidayati et al., 2025; Putri et al., 2024). Indonesia's persistent literacy challenges underscore the urgency of such efforts. The 2022 PISA assessment recorded Indonesia's reading literacy score at 359. The lowest since 2000 reflecting ongoing difficulties with reading engagement and comprehension among secondary school students (OECD, 2023). National initiatives such as the Merdeka Curriculum and the School Literacy Movement (Gerakan Literasi Sekolah/GLS) have sought to address these challenges, yet implementation barriers including insufficient resources, inadequately prepared teachers, and instruction that lacks contextual relevance persist (Aryani & Purnomo, 2024). Within English courses specifically, environmental issues are often marginalized or treated as peripheral, despite their potential to support more integrative and meaningful language learning (Nkwetisama, 2011; Setyowati, 2015).

These systemic challenges were directly observed in the research context at SMAN 7 Palembang. Preliminary observations and informal interviews revealed that students demonstrated limited awareness of environmental conditions in their school surroundings, and that ecological content in the Grade XI curriculum had not been systematically taught. The English teacher acknowledged uncertainty about how to contextualise environmental topics effectively in English lessons, while students reported perceiving ecological content as abstract and disconnected from their lived experiences. Similar difficulties have been identified in broader Indonesian studies, where teachers recognize the importance of environmental education but face practical obstacles in integrating it into English instruction (Silvhiyani et al., 2023; Darmawan & Dagamac, 2021).

Place-based pedagogy (PBP), grounded in Gruenewald's (2003) critical pedagogy of place, offers a promising framework for addressing this gap. PBP situates learning within students' immediate social and ecological environments, connecting instruction to lived experience and community contexts. Empirical research has consistently demonstrated that place-based approaches enhance reading and writing skills while deepening students' environmental awareness and stewardship (Hamilton & Polk, 2023; Hammarsten et al., 2019). By engaging students in locally grounded activities, such as observing environmental conditions around their school, writing about local flooding experiences, or analyzing water quality in English. PBP can transform ecological content from an abstract subject into a personally meaningful domain of inquiry. Previous ELT studies have similarly shown that contextual and locally grounded approaches, including the use of picture books, multimodal texts, and project-based learning, effectively support students' engagement and environmental understanding (Maskana et al., 2024; Purwandani et al., 2025).

Despite this growing evidence base, the majority of PBP research has been conducted in Western or resource-rich educational contexts, primarily within science or outdoor education domains. Empirical classroom-based implementations that integrate ecological literacy with English language learning at the secondary school level in Indonesia remain largely absent

(Febriani et al., 2020; Chowdhury & Alzarrad, 2025). Programs such as Adiwiyata have promoted environmental awareness in Indonesian schools, but their scope has not extended to systematic integration within English language instruction at the classroom level. Recent needs analysis studies further confirm this gap: Jasmine et al. (2025) found that Indonesian young learners require multimodal and locally contextualized texts to meaningfully engage with sustainability education in ELT, yet such materials remain scarce in current classroom practice. Similarly, Tabassum (2024) highlights that students are more likely to engage critically with environmental challenges when these are connected to their immediate local contexts rather than presented as distant, abstract phenomena.

This study addresses this compound gap by investigating how place-based pedagogy can enhance both ecological literacy and English language development among Grade XI students at SMAN 7 Palembang through a collaborative PAR framework. Specifically, this study addresses three research questions: (1) How does the implementation of place-based pedagogy enhance students' English ecological literacy in Grade XI at SMAN 7 Palembang? (2) How do students experience the implementation of place-based pedagogy in developing their engagement and ecological understanding in English language learning? (3) What challenges and opportunities emerge in integrating ecological literacy into English language teaching through place-based pedagogy at the senior high school level?

RESEARCH METHOD

Research Design

This study employed Participatory Action Research (PAR), as developed by Kemmis et al. (1988), as its primary research design. PAR was selected because it emphasises collaborative inquiry in which the researcher, teacher, and students function as co-participants across iterative phases of planning, action, observation, and critical reflection. Unlike experimental designs that aim to establish causal relationships through controlled conditions, PAR focuses on improving educational practices through context-sensitive, iterative processes. Within this PAR framework, a mixed-methods approach was adopted, integrating both quantitative and qualitative data to capture learning outcomes and the lived experiences of participants. The use of a mixed-methods design is consistent with recent EFL research on sustainability education, which emphasises the importance of capturing both measurable learning outcomes and students' learning experiences (Silvhiany et al., 2024).

Quantitative data were collected through pre-test and post-test assessments to track students' ecological literacy development across the instructional phases. These assessments served a formative and reflective purpose within the PAR process, providing evidence of change over time, rather than establishing causal inference. To further illustrate patterns of learning development, descriptive statistics, paired-sample t-tests, and the Friedman test were employed. Qualitative data were gathered through classroom observations and semi-structured interviews, enabling the researcher to understand not only whether students' performance improved, but also how and why such changes occurred within the place-based learning context. The integration of quantitative and qualitative data reflects the epistemological stance of PAR, which views knowledge as socially constructed, context-dependent, and co-produced through collaborative inquiry.

Research Participants

This study was conducted at the senior high school at Palembang, a public senior high school in the Kalidoni sub-district of Palembang, South Sumatra, Indonesia. The school was selected on three grounds. First, it is situated in an area marked by recurring ecological challenges; seasonal flooding, inadequate waste management, and vehicle-related air pollution that constitute authentic, locally grounded material for place-based ecological literacy instruction. Second, the English teacher had consistently omitted the environmental units from

Grade XI instruction, citing uncertainty about how to present environmental topics effectively in English, thus representing the precise pedagogical problem this study addresses. Third, the teacher herself initiated the collaborative partnership with the researcher, which is methodologically significant in PAR, where Kemmis et al. (1988) emphasise that the most transformative research originates from practitioners' own concerns.

The study involved one class of 35 Grade XI students (Class XI D2), purposively selected based on the teacher's recommendation and students' full availability across all eight PAR phases. The students were aged 16–17 years and had received no prior systematic instruction connecting English learning with environmental themes. One senior English teacher, Ibu Asiah, participated as collaborative partner and co-facilitator throughout the study. This tripartite PAR collaboration in which researcher, teacher, and students each contributed distinct and non-interchangeable expertise distinguished the study as genuine collaborative PAR rather than a researcher-designed intervention delivered to a passive classroom (Gruenewald, 2003; Kemmis et al., 1988).

Instruments

Data were collected using three main instruments: pre-test and post-test assessments, structured classroom observation sheets, and semi-structured interview guides. These instruments were selected to capture both quantitative evidence of students' ecological literacy development and qualitative insights into their learning experiences during place-based pedagogy implementation. The pre-test and post-test measured students' ecological literacy across two domains: reading ecological literacy and ecological knowledge. The reading ecological literacy instrument consisted of 25 multiple-choice comprehension items (scored 2 points each) using environmental texts sourced from the Pulitzer Center's environmental reporting database, with questions measuring literal, inferential, and evaluative comprehension levels. The ecological knowledge instrument consisted of 20 multiple-choice items (scored 5 points each) adopted from validated instruments by Karuni (2020), Kusnaeti (2024), Kustiana (2022), and García-Vinuesa et al. (2021), covering ecological concepts including ecosystems, biodiversity, pollution, and sustainability. Content validity was established through expert review by the English teacher and a curriculum representative at SMAN 7 Palembang. The pre-test and post-test design adopted in this study is consistent with established practices in research-based science and language education courses, where such instruments have been shown to effectively capture gains in students' subject knowledge, research skills, and confidence (Pavlova et al., 2021).

Classroom observations were conducted using structured observation sheets developed by the researcher to document students' engagement, interaction, environmental awareness, and English language use during each instructional meeting. Observations were conducted collaboratively by the researcher and the English teacher. Semi-structured interviews were conducted after the intervention with nine purposively selected students (three high-achieving, three medium-achieving, and three low-achieving, based on post-test scores) and with the English teacher. Selection by achievement level was intended to capture diverse perspectives across the learning spectrum, and nine interviews were sufficient to achieve thematic saturation (Guest et al., 2006). All interviews were audio-recorded and transcribed. The interview data were analyzed thematically following (Braun & Clarke, 2006) framework.

Data Analysis

Quantitative data from the pre-test and post-test were analyzed using IBM SPSS Statistics. Descriptive statistics (mean scores and standard deviations) were calculated for each measurement stage. Normality was assessed using the Shapiro-Wilk test, which confirmed violation of normality assumptions for the full dataset. A paired-sample t-test was conducted to examine whether differences between pre-test and post-test scores were statistically significant

(significance level $\alpha = .05$; null hypothesis $H_0: \mu_1 = \mu_2$). The Friedman test, a non-parametric alternative to one-way repeated-measures ANOVA was employed to examine whether statistically significant differences existed across all nine measurement stages (pre-test, Meetings 1–7, post-test), reflecting the longitudinal trajectory of learning within the PAR process. Gain scores (post-test minus pre-test) were calculated as an additional index of improvement.

Qualitative data from classroom observations and semi-structured interviews were analyzed using thematic analysis (Braun & Clarke, 2006), proceeding through six stages: data familiarization through repeated reading; generation of initial codes; searching for and identifying themes; reviewing and refining themes in relation to the full data set; defining and naming themes analytically; and producing the thematic report. Observation notes were used to triangulate interview findings. Qualitative findings were subsequently integrated with quantitative results to provide a comprehensive understanding of how place-based pedagogy influenced students' ecological literacy, engagement, and learning experiences.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

Students' Ecological Literacy: Pre-Test and Post-Test Results

Before the implementation of place-based pedagogy, students were administered a pre-test to establish baseline ecological literacy. The descriptive results indicated that initial performance was low: the mean score for reading ecological literacy was 35.31, and the mean score for ecological knowledge was 30.43 ($N = 35$). These scores indicate that ecological concepts had not been systematically developed in English prior to the intervention. Many students struggled to comprehend environmental texts, identify key ideas, or respond to inferential comprehension questions. Ecological terms such as pollution, waste management, flooding, and sustainability were largely unfamiliar when presented in English, and classroom observation during the pre-test phase confirmed that students relied heavily on guessing strategies and word-by-word translation.

Following the implementation of place-based pedagogy across eight instructional meetings, students' post-test scores showed substantial improvement. The mean score for reading ecological literacy increased from 35.31 to 79.71, and the mean score for ecological knowledge increased from 30.43 to 77.86. Students demonstrated clearer comprehension of environmental texts, improved ecological vocabulary, and greater confidence in interpreting ecological information in English. This finding supports previous studies indicating that contextualized English instruction integrating environmental themes contributes to improved comprehension and ecological understanding among EFL learners (Putri et al., 2024; Masitoh et al., 2025).

Table 1
Paired-Sample t-Test Results for Students' Reading Ecological Literacy

Variable	N	Mean Pre-Test	Mean Post-Test	Mean Difference	t	df	Sig. (2-tailed)
Reading Ecological Literacy	35	35.31	79.71	-44.40	-18.71	34	.000

Table 2
Paired-Sample t-Test Results for Students' Ecological Knowledge

Variable	N	Mean Pre-Test	Mean Post-Test	Mean Difference	t	df	Sig. (2-tailed)
Ecological Knowledge	35	30.43	77.86	-47.43	-22.54	34	.000

The paired-sample t-test confirmed statistically significant improvements in both dimensions of ecological literacy. For reading ecological literacy, mean scores increased by 44.40 points, yielding $t(34) = -18.71$, $p < .001$. For ecological knowledge, mean scores increased by 47.43 points, yielding $t(34) = -22.54$, $p < .001$, with a 95% confidence interval $[-51.705, -43.152]$ confirming that this improvement was not attributable to sampling error. The slightly larger effect size observed for ecological knowledge compared to reading literacy is theoretically noteworthy: it suggests that direct environmental engagement, observation activities, discussions of local flooding, water quality investigations, may produce particularly strong conceptual learning, consistent with McBride et al.'s (2013) contention that ecological literacy develops most deeply when learners interact with ecosystems directly rather than encountering them through textbook representations alone.

Implementation Overview of Place-Based Pedagogy

The eight instructional meetings were implemented as iterative PAR phases of planning, action, observation, and critical reflection, enabling continuous refinement of instructional strategies. The meetings progressed through three broader phases: (1) initial engagement and baseline formation (Meetings 1–2), (2) instructional refinement and cognitive challenge (Meetings 3–6), and (3) consolidation and the development of student agency (Meetings 7–8).

Table 3
Overview of Place-Based Pedagogy Implementation Across Eight Instructional Meetings

Meeting	Focus	Place-Based Activities	Materials/Tools
1	Introduction to local environmental issues	Observation of school surroundings; reading and discussing descriptive texts about waste problems	PowerPoint, reading text, observation sheet, worksheet
2	Identifying types of waste	Observation of school areas (canteen, classrooms, parking area); descriptive writing based on personal documentation	Observation sheet, pictures, worksheet
3	Air pollution	Reading environmental texts on Palembang air pollution; creating environmental posters with descriptive text	Reading text, pictures, poster paper, PowerPoint
4	Water pollution	Simple water quality testing using litmus paper; writing descriptive text based on experimental observation	Litmus paper, water samples, observation sheet, worksheet
5	Narrative text: flooding experiences	Reading local narrative text (The Legend of the Flooded City); identifying narrative structure; writing summaries based on personal flooding experiences	Narrative worksheet, writing guide, PowerPoint
6	Narrative development: plastic waste	Reading narrative text on tumbler movement; group narrative planning and drafting on plastic waste; oral presentation of group summaries	Narrative planning sheet, peer review template
7	Air pollution: individual narrative writing	Reading narrative text (The Grey Sky Over Palembang); individual narrative writing; oral presentations	Worksheet, narrative structure guide
8	Consolidation: group narrative and wall magazine	Collaborative group narrative writing; peer review; production of Eco-Story Board (wall magazine/mading)	Writing paper, poster materials, peer review checklist

The overall progression across eight meetings reflects a non-linear but cumulative learning trajectory. Initial limitations in ecological literacy were addressed through contextualized and experiential learning, while temporary performance fluctuations notably a

decline at Meeting 5 during the transition to narrative text, represent moments of cognitive adjustment rather than failure. The final group-based narrative writing and wall magazine activities further supported collaborative learning and consolidation of ecological literacy, demonstrating that place-based pedagogy facilitated both language development and deeper ecological awareness throughout the instructional process.

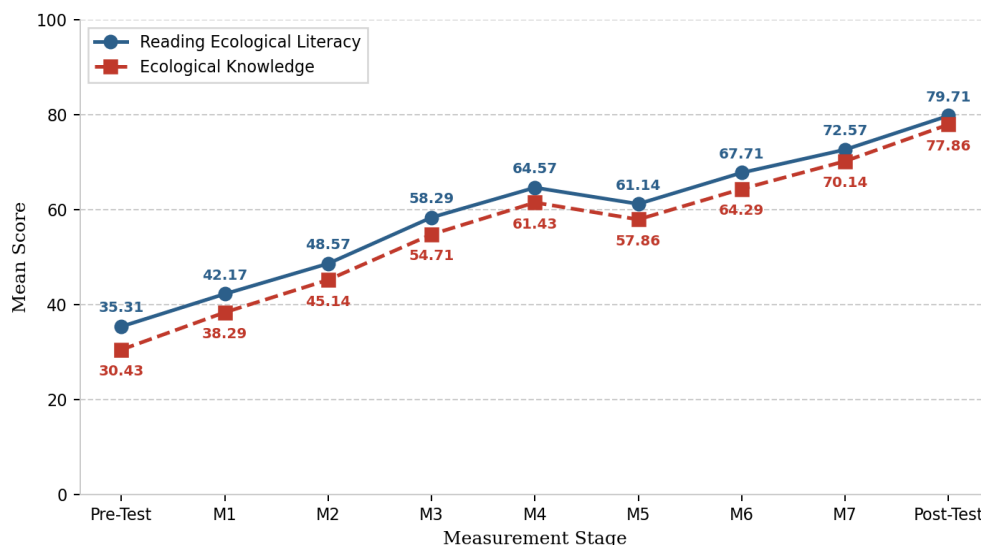


Figure 1. Trend of Students' Mean Scores from Pre-Test to Post-Test across Eight Instructional Meetings

As illustrated in Figure 1, students' mean scores followed a non-linear but upward trajectory overall. A substantial increase was observed between Meetings 2 and 3, reflecting the impact of expanded reading and experiential learning activities. The temporary decline at Meeting 5 coincided with the genre transition from descriptive to narrative text, representing a phase of cognitive adjustment rather than regression, consistent with constructivist learning theory (Sobel, 2004). Scores subsequently recovered and consolidated through Meetings 6 to 8, culminating in post-test results that were significantly higher than baseline.

Students' Experiences of Place-Based Pedagogy

Theme 1: Relevance and Real-Life Connection

The most prominent finding from the student interviews was the strong connection between place-based learning content and students' lived environmental experiences. Students consistently reported that English learning became more meaningful when environmental topics reflected their immediate surroundings, such as their school, homes, and neighborhoods. One student noted that pollution is not something only encountered in books, but is also present in their school and near their home (SK). Another explained that flooding is personally relevant because they frequently experience it at their own house (CAP). A third student observed that because the environmental problems were already familiar, they only needed to focus on how to explain them in English (ZMPA).

These responses indicate that place-based pedagogy enabled students to situate English learning within their lived experiences. Environmental issues were no longer perceived as abstract or distant concepts but as realities embedded in daily life. This contextual relevance functioned as a cognitive bridge that facilitated both language comprehension and ecological awareness, enabling students to relate English vocabulary and texts to observable phenomena. These findings illuminate a central mechanism through which place-based pedagogy operates in the EFL classroom: the transformation of ecological content from abstract, decontextualized

information into personally meaningful knowledge—precisely what Gruenewald (2003) describes as the defining characteristic of critical place-based pedagogy.

Table 4
Coding Summary for Relevance and Real-Life Connection

Participant Code	Key Expressions	Sub-Themes
SK, CAP	Environmental problems exist in school and at home	Real-life relevance
TSA, CAP	Flooding is experienced personally	Personal experience
ZMPA, NNS	Easier to explain ideas in English because topics are familiar	Contextual learning

Theme 2: Emotional Engagement and Learning Motivation

Students reported increased emotional engagement and learning motivation when studying English through local environmental topics. Several students expressed positive emotions including excitement, comfort, and reduced anxiety. One student explained that the learning felt interesting because the topics were connected to daily life, making them easier to understand (NK). Another noted that although English is usually difficult, discussing the environment around them made comprehension more accessible (NNS). A third student reported feeling more comfortable because the topics were close to their daily experiences (CAP).

Classroom observations supported these self-reports: students were more willing to participate in discussions, engage in observation activities, and present their work. This emotional engagement appears to have functioned as an anxiety-reducing mechanism, consistent with Krashen's (1985) Affective Filter Hypothesis creating conditions in which students felt sufficiently psychologically safe to engage, express, and participate. Sobel's (2004) concept of place attachment also helps explain these findings: students perceived the subject matter as belonging to their own experiential world rather than to an external curriculum, fostering a sense of ownership that motivated active participation.

Table 5
Coding Summary for Emotional Engagement and Learning Motivation

Participant Code	Key Expressions	Sub-Themes
NK, A	Learning felt enjoyable and not boring	Enjoyment
NNS, CAP	English felt easier to understand when topics are familiar	Reduced anxiety
TSA, SK	Increased confidence in learning English through local topics	Learning confidence

Theme 3: Improved Understanding of Ecological Issues through English

Students demonstrated improved conceptual understanding of ecological issues through English language learning. Rather than memorizing isolated vocabulary items, students learned to contextualize ecological concepts including waste management, pollution, flooding, and environmental protection within meaningful real-world contexts. One student explained that after the learning, they now understand that waste can cause flooding and pollution (TSA). Another noted that environmental issues can be discussed in English, not only in science subjects (NK). A third student reported learning new vocabulary words like pollution, plastic waste, and water pollution and now understanding what they mean in real life (NNS).

These responses indicate that place-based pedagogy promoted the development of what McBride et al. (2013) call functional ecological literacy, the capacity to explain environmental phenomena, identify their causes and consequences, and articulate responses using academic language. This form of literacy is qualitatively different from vocabulary-focused language

learning: students explicitly identified English as a valid medium for discussing environmental issues, suggesting that place-based pedagogy successfully disrupted the disciplinary boundaries that typically confine ecological content to science classrooms.

Table 6
Coding Summary for Improved Understanding of Ecological Issues through English

Participant Code	Key Expressions	Sub-Themes
TSA, MMI	Understanding causes and impacts of pollution and flooding	Cause-effect awareness
NK	Environmental issues can be discussed in English, not only in science	Interdisciplinary understanding
NNS, ENK	Learning new ecological vocabulary with real-life meaning	Vocabulary development

Theme 4: Active Participation and Growing Environmental Awareness

The fourth theme highlights students' increased active participation and emerging pro-environmental awareness. After place-based learning activities, students reported behavioral changes and a stronger sense of environmental responsibility. One student indicated that after the learning, they try not to litter and remind friends to dispose of trash properly (NNS). Another reported reducing plastic use and bringing their own bottle to school (ZMPA). A third noted that they became more aware of the importance of choosing where to dispose of trash (SK).

Table 7
Coding Summary for Active Participation and Growing Environmental Awareness

Participant Code	Key Expressions	Sub-Themes
NNS, ZMPA	Reducing plastic use and disposing of waste properly	Pro-environmental behavior
SK, NNS	Reminding friends to care for the environment	Social awareness

Teacher Findings: Challenges and Opportunities in Integrating Ecological Literacy

Theme 5: Limited Pedagogical Familiarity and Initial Uncertainty

The teacher's interview revealed that initial uncertainty stemmed not from resistance to environmental education, but from limited familiarity with place-based pedagogy as a distinct instructional framework. She reported that before the collaboration, she had not been familiar with the term 'place-based pedagogy', and had only heard about contextual learning. She acknowledged that environmental topics were sometimes avoided because she lacked confidence in how to present them effectively in English, rather than because she considered them unimportant.

Table 8
Coding Summary for Limited Pedagogical Familiarity and Initial Uncertainty

Participant Code	Key Expressions	Sub-Themes
T	Unfamiliar with place-based pedagogy; had only heard of contextual learning	Limited conceptual knowledge
T	Environmental topics felt abstract and difficult to teach in English	Pedagogical uncertainty
T	Reliance on textbook-centered teaching; environmental units often skipped	Traditional instruction

Theme 6: Collaboration as Professional Support and Capacity Building

Despite initial uncertainty, collaboration between the teacher and the researcher became a significant vehicle for professional development. The teacher explained that the researcher

helped prepare clearer lesson plans, attractive PowerPoint slides, and worksheets that encouraged students to discuss their own environment in English and that she also learned new ways to make environmental topics more interactive and meaningful. This collaboration functioned as capacity building, enabling the teacher to transform abstract environmental concepts into concrete classroom activities.

Table 9
Coding Summary for Collaboration as Professional Support and Capacity Building

Participant Code	Key Expressions	Sub-Themes
T	Collaborative lesson planning and material preparation	Professional support
T	Learning new interactive teaching strategies	Pedagogical growth
T	Increased confidence; intention to continue using place-based pedagogy	Capacity building

Theme 7: Opportunities for Interdisciplinary and Experiential Learning

The teacher identified place-based pedagogy as creating valuable opportunities for interdisciplinary learning. She highlighted that English lessons could be combined with scientific activities specifically citing the use of litmus paper for water quality testing as an example of combining chemistry and English. This interdisciplinary dimension enriched students' understanding of ecological issues while simultaneously strengthening their English language skills, demonstrating that language learning can extend beyond linguistic exercises to include scientific inquiry and real-world problem-solving.

Table 10
Coding Summary for Opportunities for Interdisciplinary and Experiential Learning

Participant Code	Key Expressions	Sub-Themes
T	English lesson combined with chemistry activities such as litmus paper water testing	Interdisciplinary learning
T	School environment and local ecological issues used authentic learning resources	Contextual instruction
T	Hands-on activities helped students connect with environmental challenges meaningfully	Experiential learning

Theme 8: Enhanced Student Engagement and Pedagogical Effectiveness

The teacher consistently observed that students were more actively engaged during place-based lessons compared to conventional textbook-centered instruction. She noted that students enjoyed discussing real problems they experience every day, and that they demonstrated increased confidence during presentations. She also reported observable improvement in students' written performance: when scoring their worksheets, she could see that their scores increased compared to the first chapter. The teacher's observation that familiarity with local environmental problems helped students speak English more naturally further confirms that place-based pedagogy enhanced both ecological awareness and overall pedagogical effectiveness.

Table 11
Coding Summary for Enhanced Student Engagement and Pedagogical Effectiveness

Participant Code	Key Expressions	Sub-Themes
T	Students actively participated in discussions and were more willing to share ideas	Active engagement
T	Students showed increased confidence during English presentations	Learner confidence
T	Observable improvement in worksheet scores and written output quality	Learning outcomes

Theme 9: Balancing Practical Challenges with Long-Term Sustainability

Although time management initially appeared challenging, the teacher noted that activities required more time than usual she subsequently clarified that the activities were manageable within the allocated two-period instructional slot. She expressed a strong and explicit intention to continue applying place-based pedagogy in future lessons, stating that she plans to use the lesson plans and worksheets developed during the collaboration for the next class. This commitment to continuation confirms that the practical challenges encountered were perceived as manageable and temporary rather than prohibitive, and that the perceived benefits of place-based pedagogy motivated sustained implementation.

Table 12
Coding Summary for Balancing Practical Challenges with Long-Term Sustainability

Participant Code	Key Expressions	Sub-Themes
T	Activities initially required more time than conventional lessons	Time management
T	Plans to reuse lesson plans and worksheets for the next class independently	Sustainability of practice
T	Incorporated environmental topics into formal Grade XI examination in the following year	Curricular integration

Discussion

When students in Class XI D2 sat down for their post-test after eight weeks of place-based learning, their mean scores had nearly doubled from 35.31 to 79.71 for reading ecological literacy, and from 30.43 to 77.86 for ecological knowledge. These numbers are striking, but what is perhaps more telling is why they improved. Students were not simply exposed to new vocabulary or grammar structures; they were asked to observe the drainage system near their school canteen, test water samples with litmus paper, and write in English about floods they had personally experienced. Paired-sample t-test results confirmed that these gains were statistically significant for both reading ecological literacy ($t(34) = -18.71$, $p < .001$) and ecological knowledge ($t(34) = -22.54$, $p < .001$), supporting Orr's (1992) argument that ecological literacy grows most effectively through direct engagement with environmental conditions rather than passive reception of facts. These findings also align with prior Indonesian EFL research showing that integrating environmental themes into English instruction meaningfully supports both language development and ecological understanding (Silvhiyani et al., 2023; Hidayati et al., 2025).

The larger effect size observed for ecological knowledge compared to reading literacy is theoretically significant. It supports Orr (1992) argument that ecological literacy develops most effectively through direct interaction with real-world environmental contexts rather than through abstract textbook representations. The Friedman test further confirmed significant differences across all nine measurement stages ($p < .001$), revealing a non-linear but cumulative learning trajectory. The temporary performance decline observed at Meeting 5 coinciding with the transition from descriptive to narrative text reflects a process of cognitive adjustment consistent with constructivist learning theory (Sobel, 2004) rather than a failure of the pedagogical approach, as evidenced by the subsequent recovery in Meetings 6 and 7.

Students' increased engagement further highlights the effectiveness of place-based pedagogy. Qualitative findings from interviews and classroom observations revealed that learning activities grounded in local environmental issues reduced abstraction and encouraged active participation. This finding aligns with Gruenewald (2003), who emphasizes the importance of place in meaningful learning. Emotional engagement also played a key role: students felt more confident and motivated when discussing familiar topics, consistent with Sobel's (2004) concept of place attachment and Krashen's (1985) Affective Filter Hypothesis. The development of pro-environmental attitudes and behaviors among students reflects the broader scope of ecological literacy, which encompasses values and action alongside

knowledge (Capra & Stone, 2010). Through observation, writing, and reflection, students translated learning into concrete environmental actions a behavioral shift that reflects the broader goals of climate change education in ELT, which emphasize awareness, critical engagement, and responsible action (Purwandani et al., 2025; Silvhiany et al., 2024).

From the teacher's perspective, the findings highlight the centrality of researcher-teacher collaboration in implementing innovative pedagogy. The teacher's progression from initial uncertainty to confident, collaborative implementation and ultimately to independent curricular integration of ecological content in the following academic year exemplifies what Kemmis et al. (1988) describe as the transformative potential of collaborative PAR for educational practitioners. Unlike top-down professional development programs, the PAR framework in this study enabled professional growth through shared co-design, joint observation, and iterative co-reflection, generating genuine pedagogical ownership because the teacher was an equal partner in producing knowledge. This aligns with Fullan et al. (2018), who identify collaborative teacher development as essential to sustainable educational change.

Taken together, the findings demonstrate that place-based pedagogy functions as a pedagogical bridge between English language learning and ecological literacy development. Consistent with Gruenewald (2003) critical pedagogy of place, learning grounded in local environmental contexts enabled students to connect language use with lived ecological realities. This alignment allowed students to construct meaning through direct experience rather than abstract textual exposure alone. The integration of ecological literacy within English instruction supports Orr (1992) and Capra and Stone (2010) view that ecological understanding must extend beyond knowledge acquisition to include awareness and responsible action. A key limitation of this study is its focus on a single class at one school in Palembang, which constrains the generalizability of findings. Future research should investigate place-based pedagogy across different grade levels, school contexts, and regions in Indonesia to assess the transferability of this model.

CONCLUSION

This study concludes that implementing place-based pedagogy within a collaborative Participatory Action Research framework effectively enhanced Grade XI students' English ecological literacy at SMAN 7 Palembang. By integrating local environmental issues into English language learning, students demonstrated statistically significant improvements in both ecological knowledge ($t(34) = -22.54, p < .001$) and reading ecological literacy ($t(34) = -18.71, p < .001$), as evidenced by pre-test and post-test results supported by paired-sample t-test and Friedman test analyses. Beyond the test scores, the student interviews revealed something equally important. When environmental topics were drawn from students' own neighborhoods and daily experiences, English stopped feeling like a foreign subject and started feeling relevant. Students who previously found English difficult reported feeling more comfortable and motivated not because the language had become easier, but because they finally had something real to say in it. Several students also described changes in their behavior outside the classroom: bringing their own water bottles, reminding friends not to litter, and paying closer attention to where they dispose of their trash. These shifts suggest that the learning reached beyond academic performance into students' everyday lives reflecting a holistic form of ecological literacy that encompasses knowledge, attitudes, and action, which conventional English instruction had not previously achieved in this context.

Teacher findings further demonstrated that the PAR collaboration produced sustained professional development, evidenced most concretely by the teacher's independent decision to incorporate environmental topics into formal Grade XI examinations in the subsequent academic year a tangible marker of the approach's long-term pedagogical impact. This study is limited by its single-class, single-school design, which restricts the generalizability of findings. Future research should explore the long-term effects of place-based pedagogy across diverse

educational levels and Indonesian school contexts, and investigate how the model may be scaled or adapted for broader implementation. For EFL teachers and curriculum developers, this study offers a practical, replicable model for integrating ecological literacy into English instruction in ways that connect language learning with students' lived environmental experiences, supporting both the Merdeka Curriculum's goals and the broader imperatives of the Sustainable Development Goals.

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INFORMED CONSENT STATEMENT

All participants provided informed consent prior to participation. Students and the teacher were informed of the study's aims, procedures, potential risks and benefits, and their right to withdraw at any time without penalty. Confidentiality of all participant information was maintained throughout the study.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study are not publicly available due to ethical obligations protecting participant privacy and confidentiality. Researchers seeking access to the dataset for validation or further study may submit a reasoned request to the corresponding author, subject to institutional ethics review board approval.

DECLARATION OF USE OF AI TOOLS

In preparing this manuscript, the author used AI-assisted tools for the purposes of language editing and proofreading only. All research design, fieldwork, data collection, data analysis, interpretation of findings, and academic conclusions presented in this study are entirely the independent work of the author.

REFERENCES

- Abdallah, A. K. (2024). Local to global: Place-based learning in sustainability education. In Legal frameworks and educational strategies for sustainable development (pp. 233–257). IGI Global. <https://doi.org/10.4018/979-8-3693-2987-0.ch013>
- Aryani, W. D., & Purnomo, H. (2024). Gerakan Literasi Sekolah (GLS) dalam budaya membaca peserta didik sekolah dasar di Indonesia. *Jurnal Ilmu Pendidikan dan Kebudayaan*, 2, 1–10. <https://doi.org/10.55266/jurnalmind.v4i2.407>
- Asad, M. M., Naz, A., Churi, P., & Tahanzadeh, M. M. (2021). Virtual reality as pedagogical tool to enhance experiential learning: A systematic literature review. *Education Research International*, 2021, 1–12. <https://doi.org/10.1155/2021/7061623>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Capra, F., & Stone, M. K. (2010). *Smart by nature: Schooling for sustainability*. Watershed Media.
- Chowdhury, S., & Alzarrad, A. (2025). Advancing community-based education: Strategies, challenges, and future directions. *Trends in Higher Education*, 4(2), 21. <https://doi.org/10.3390/higheredu4020021>
- Darmawan, M. D., & Dagamac, N. H. (2021). Situation of environmental education in senior high school programs in Indonesia: Perspectives from the teachers of Palembang.

- Interdisciplinary Journal of Environmental and Science Education, 17(3), e2241. <https://doi.org/10.21601/ijese/9605>
- Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). Effective teacher professional development. Learning Policy Institute. <https://learningpolicyinstitute.org/product/effective-teacher-professional-development-report>
- Eliyawati, E., Widodo, A., Kaniawati, I., & Fujii, H. (2023). Effectiveness of teacher training on environmental education. Jurnal Penelitian Pendidikan IPA, 9(8), 6056–6066. <https://doi.org/10.29303/jppipa.v9i8.3153>
- Febriani, R., Fariyah, U., & Nasution, N. E. A. (2020). Adiwiyata school: An environmental care program as an effort to develop Indonesian students' ecological literacy. Journal of Physics: Conference Series, 1563(1), 012062. <https://doi.org/10.1088/1742-6596/1563/1/012062>
- Fullan, M., Quinn, J., & McEachen, J. (2018). Deep learning: Engage the world change the world. Corwin Press.
- Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Methods of data collection in qualitative research: Interviews and focus groups. British Dental Journal, 204(6), 291–295. <https://doi.org/10.1038/bdj.2008.192>
- Gruenewald, D. A. (2003). The best of both worlds: A critical pedagogy of place. Educational Researcher, 32(4), 3–12. <https://doi.org/10.3102/0013189X032004003>
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. Field Methods, 18(1), 59–82. <https://doi.org/10.1177/1525822X05279903>
- Hamilton, E., & Polk, L. M. (2023). The impact of place-based education on middle school students' environmental literacy and stewardship. Cogent Education, 10(1), 1–17. <https://doi.org/10.1080/2331186X.2022.2163789>
- Hammarsten, M., Askerlund, P., Almers, E., Avery, H., & Samuelsson, T. (2019). Developing ecological literacy in a forest garden: Children's perspectives. Journal of Adventure Education and Outdoor Learning, 19(3), 227–241. <https://doi.org/10.1080/14729679.2018.1517371>
- Hassan, A., & Ismail, M. Z. (2011). The infusion of environmental education in chemistry teaching and students' awareness and attitudes towards environment in Malaysia. Procedia – Social and Behavioral Sciences, 15, 3404–3409. <https://doi.org/10.1016/j.sbspro.2011.04.309>
- Hidayati, R., Silvhiyany, S., & Inderawati, R. (2025). Literature for empowerment: Using picture books to promote SDG awareness and reading skills in Indonesian junior high schools. VELES Journal, 9(2), 314–328. <http://dx.doi.org/10.29408/veles.v9i2.30255>
- Jasmine, M. P., Silvhiyany, S., & Inderawati, R. (2025). Exploring young learners' needs in multimodal text design for integrating sustainable education into ELT. Journal of Languages and Language Teaching, 13(2), 785. <https://doi.org/10.33394/jollt.v13i2.13775>
- Kemmis, S., McTaggart, R., & Nixon, R. (1988). The action research planner. Deakin University Press.
- Krashen, S. D. (1985). The input hypothesis: Issues and implications. Longman.
- Maskana, N., Silvhiyany, S., & Mirizon, S. (2024). Unlocking the needs to design audiovisual media to incorporate climate change education in ELT. Journal of English Education and Teaching, 8(1), 106–128. <https://doi.org/10.33369/jeet.8.1.106-128>
- Masitoh, M., Silvhiyany, S., & Inderawati, R. (2025). Integrating climate change education into secondary school English lesson: A project-based approach using trade books. Jo-ELT, 12(1), 84–102. <https://doi.org/10.33394/jo-elt.v12i1.15272>

- McBride, B. B., Brewer, C. A., Berkowitz, A. R., & Borrie, W. T. (2013). Environmental literacy, ecological literacy, ecoliteracy: What do we mean and how did we get here? *Ecosphere*, 4(5), 1–20. <https://doi.org/10.1890/ES13-00075.1>
- Nkwetisama, C. M. (2011). EFL/ESL and environmental education: Towards an eco-applied linguistic awareness in Cameroon. *World Journal of Education*, 1(1), 110–118. <https://doi.org/10.5430/wje.v1n1p110>
- OECD. (2023). PISA 2022 results (Volume I): The state of learning and equity in education. OECD Publishing. <https://doi.org/10.1787/53f23881-en>
- Orr, D. (1992). *Ecological literacy: Education and the transition to a postmodern world*. State University of New York Press.
- Pavlova, I. V., Remington, D. L., Horton, M., Tomlin, E., Hens, M. D., Chen, D., Willse, J., & Schug, M. D. (2021). An introductory biology research-rich laboratory course shows improvements in students' research skills, confidence, and attitudes. *PLoS ONE*, 16(12), e0261278. <https://doi.org/10.1371/journal.pone.0261278>
- Purwandani, E., Silvhiany, S., & Inderawati, R. (2025). Measuring what matters: A design-based development of English literacy assessment integrating climate literacy for EFL learners. *JELTIM*, 7(2), 163–181. <https://doi.org/10.26418/jeltim.v7i2.96878>
- Putri, C., Silvhiany, S., & Inderawati, R. (2024). Empowering young learners: Integrating climate change education with bilingual picture books in ELT. *English Review: Journal of English Education*, 12(2), 601–616. <https://doi.org/10.25134/erjee.v12i2.9889>
- Setyowati, L. (2015). Integrating character building into teaching to enhance students' environmental awareness. *Journal on English as a Foreign Language*, 5(1), 1–10. <https://doi.org/10.23971/jefl.v5i1.139>
- Silvhiany, S., Kurniawan, D., & Safrina, S. (2023). Climate change awareness in ELT: Ethnography in connected learning and ecojustice pedagogy. *JELTIM*, 5(2), 91–109. <https://doi.org/10.26418/jeltim.v5i2.63548>
- Silvhiany, S., Kurniawan, D., & Safrina, S. (2024). Teaching about climate change in EFL teacher education: Curricular engagement for critical awareness. *AIP Conference Proceedings*, 3052(1), 020063. <https://doi.org/10.1063/5.0201005>
- Silvhiany, S., Rahmadhani, S., Inderawati, R., Meilinda, M., & Trilestari, K. (2023). Integrating climate change into English language teaching: A survey of Indonesian teachers' preparedness and perspectives. *Voice of English Language Education Society*, 7(3), 801–815.
- Sobel, D. (2004). *Place-based education: Connecting classrooms and communities*. The Orion Society.
- Tabassum, S. (2024). Perspectives through the lens of educators and students: Teaching flood mitigation and other controversial food, energy, water nexus issues in the classroom. *Journal of Environmental Education*, 55(1), 1–15.