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From Colonial Narratives to Ecological Narratives: An Experiment of Green History Pedagogy in High School History Learning

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ABSTRACT
Conventional history teaching often centers on colonial narratives that highlight power, conquest, and national identity. Although such narratives help shape collective memory, they tend to overlook the ecological dimensions of history and the interaction between humans and nature. This anthropocentric view narrows students' understanding of how the environment actively shapes historical change. This study aims to examine the implementation of Green History Pedagogy as a history learning approach that emphasizes ecological awareness in high schools in Jember Regency, East Java, Indonesia. The approach was developed to shift historical narratives from colonial perspectives toward a more critical and contextual understanding of the environment. This research employs a Mixed Methods Research (MMR) design involving classroom observation, interviews with teachers and students, analysis of lesson plans, and questionnaires on ecological attitudes. The findings reveal that implementing Green History Pedagogy encourages teachers and students to reflect on the relationship between history, environment, and local life. Students became more critical of the colonial legacy contributing to environmental degradation and demonstrated increased ecological awareness throughout the learning process. Overall, this approach effectively enhances the relevance of history education to environmental sustainability and local identity issues.

KEYWORDS
Green history pedagogy; ecological narratives; history education.

INTRODUCTION

In the 21st century, integrating ecological awareness into history education has become crucial from both pedagogical and epistemological perspectives (Hadjichambis & Paraskeva-Hadjichambi, 2020; Li et al., 2025). Global environmental crises such as deforestation, climate change, and biodiversity loss are now understood not only as scientific or political issues but also as cultural and historical phenomena (Elliott et al., 2017; Pfenning-Butterworth et al., 2024). As both a discipline and a form of consciousness, history plays a critical role in shaping society's understanding of the relationship between the past and the environment and in envisioning a sustainable future (Chakrabarty, 2021; Cronon, 1992). However, in countries such as Indonesia, which has a postcolonial historical background, existing history teaching methods still produce colonial and anthropocentric narratives. These narratives glorify modernization while neglecting the ecological dimensions of human experience.

In Indonesian high schools, the national history curriculum remains dominated by state-centered and colonial historiography (Djono et al., 2021). Such narratives often emphasize political transitions, colonial resistance, and nation-building while overlooking the ecological changes that occurred alongside these processes (Barry, 2006; McGregor et al., 2021; Suwignyo, 2014). For instance, the colonial plantation economy significantly impacted local landscapes, water systems, and labor relations across Java. Yet, these environmental impacts are rarely discussed in classroom education. Instead, narratives of "progress" are depicted as achievements in agricultural and plantation development (Boomgaard, 2013; Lukas & Peluso, 2019).

This separation between history and ecology carries pedagogical consequences. Students are encouraged to memorize chronological facts rather than engage critically with the socio-ecological dynamics underlying historical change (McGregor et al., 2021; Power & Kitson, 2024). As a result, history learning often fails to foster environmental literacy or critical awareness of sustainability (Popa, 2023). The need to reform history education through ecological and ethical frameworks has become increasingly recognized in education worldwide (McBride et al., 2013; Sterling, 2010). Scholars such as (Cutter-Mackenzie-Knowles et al., 2020; Gruenewald, 2003). have suggested that critical environmental pedagogy and place-based education can serve as transformative methods for rebuilding learners' relationships with their environment and local history.

Within this broader discussion, the idea of Green History Pedagogy emerges as a teaching innovation that places environmental awareness at the core of history education (Cutter-Mackenzie-Knowles et al., 2020; McBride et al., 2013). It motivates teachers and students to view the past from an ecological perspective and to explore how local environments have influenced and been influenced by human activities, colonial economies, and modernization. Green History Pedagogy positions the environment as an active historical agent, shaping social, cultural, and political trajectories (Chakrabarty, 2021; Hollstein, 2022).

Although conceptually promising, empirical studies exploring Green History Pedagogy in Indonesia's postcolonial context remain scarce (Nomura, 2009). Most environmental education research in Indonesia focuses on natural sciences or civic education (Aswita et al., 2024), while history education remains marginalized in sustainability discourses (Maniatis, 2024; McGregor et al., 2021). Furthermore, existing studies tend to emphasize curriculum policy rather than classroom practice, where teachers and students actively construct meaning and value from history. This lack of empirical engagement creates a significant research gap concerning how ecological narratives can be pedagogically integrated into history learning and how such integration can reshape students' ecological consciousness.

Jember Regency in East Java, Indonesia, presents a unique socio-historical and ecological landscape. As a former center of the colonial plantation economy, Jember embodies a history of environmental transformation, labor exploitation, and cultural intersection. The complex interactions between humans and nature make Jember an ideal case for exploring how Green History Pedagogy can be implemented and contextualized. In this region, historical memory and ecological realities intersect, providing fertile ground for students to critically reflect on the colonial past and its contemporary environmental legacies.

Theoretically, this study contributes to the intersection of critical environmental pedagogy, postcolonial history education, and environmental humanities by proposing a model of history teaching that reconstructs colonial narratives into ecological ones. Practically, it offers a pedagogical alternative for Indonesian educators seeking to align history learning with global sustainability goals and local ecological identity. By foregrounding the ecological dimensions of history, this study argues that the past can serve not only as a source of national identity but also as a medium for ecological reflection and ethical action.

This research critically examines the transformative potential of Green History Pedagogy in reorienting students' historical consciousness from anthropocentric and colonial frameworks toward an ecology-based understanding of the past. It explores how history education can serve as a medium for fostering ecological awareness and moral responsibility toward the environment. The study positions history not merely as a record of human progress but as a dynamic interaction between humans and ecological systems, challenging traditional narratives that have long marginalized environmental perspectives in history learning.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Green History Pedagogy: Reframing Historical Consciousness

Green History Pedagogy integrates environmental ethics with historical inquiry, aiming to reshape human perceptions and narratives of the past (Hutagalung et al., 2025). This pedagogy emerges from the convergence of ecological humanities and critical pedagogy, emphasizing that history should not only record human achievements but also highlight the ecological impacts of colonial actions (Cutter-Mackenzie-Knowles et al., 2020; Jickling & Sterling, 2017).

This approach questions the ecological bias in traditional historiography, which often portrays nature as a passive backdrop to human progress. In contrast, it views the environment as a co-actor in history, influencing and being influenced by human change (Cronon, 1992). In this context, history teaching requires the cultivation of ecological historical consciousness that connects social, economic, and political narratives with environmental change (Chakrabarty, 2021).

In practice, Green History Pedagogy emphasizes experiential and place-based learning. Students engage with their surroundings, such as rivers, forests, plantations, or urban spaces as historical sites that preserve the legacy of human-environment interaction (Gruenewald, 2003). Learning activities may include fieldwork, archival exploration, storytelling, or community mapping. Through these activities, students not only gain historical knowledge but also develop empathy toward ecological systems and critical awareness of environmental sustainability.

Postcolonial Historiography and Environmental Narratives

Postcolonial studies provide a crucial foundation for understanding why ecological narratives are often absent in history education. Colonial historiography frequently portrays nature as something to be dominated and exploited (Arnold, 1996; Harrison, 1996) . In postcolonial contexts, this worldview persists through educational resources that glorify modernization while ignoring environmental degradation (Boomgaard, 2013; Lukas & Peluso, 2019).

Educators can challenge the entrenched Eurocentric and extractive logic in history education by connecting postcolonial critique with Green History Pedagogy. These reframing invites students to examine inherited narratives and develop an ecocentric historiography aligned with local ecological realities and cultural wisdom (Darmawan et al., 2025; Hermana, 2018).

Critical Environmental Pedagogy and Place-Based Learning

Green History Pedagogy is closely related to Critical Environmental Pedagogy, which focuses on social justice, ecological awareness, and transformative learning (Gruenewald, 2003; Stevenson, 2007). Critical Environmental Pedagogy views education as a political act that should reveal the power dynamics behind environmental exploitation (Cocato, 2019; Gunansyah et al., 2023; Kavaz et al., 2021; Pfenning-Butterworth et al., 2024). It argues that learners should not only understand environmental issues but also engage critically in efforts to change them.

At the same time, Place-Based Education strengthens Critical Environmental Pedagogy by grounding learning in local environments (Cicchino et al., 2023; Iared, 2015; Semken et al., 2017; Yemini et al., 2025). Place-Based Education situates knowledge within the ecological, cultural, and historical context of a particular location (Smith & Sobel, 2014). When integrated, Place-Based Education and Critical Environmental Pedagogy provide a strong foundation for structuring Green History Pedagogy: a framework that connects historical content with local ecological experiences while empowering students as agents of sustainability.

In Jember, this integration is highly relevant. The region's environmental and colonial histories are deeply intertwined, making it an ideal context for applying place-based critical

pedagogy. By using local case studies such as tobacco planting, tea plantations, and coffee estates, teachers can bridge historical consciousness with ecological literacy.

Green Historical Consciousness: Toward a Transformative Educational Model

Most modern theories of history education are based on the concept of historical consciousness (seixas, 2004). This refers to the ability to connect the past, present, and future in meaningful ways. By incorporating ecology into this concept, we can describe green historical consciousness as an awareness that reflects human history as part of ecological systems.

To develop green historical consciousness, pedagogical strategies should be described as follows:

1. Reconstructing historical narratives to include environmental elements
2. Encouraging reflection on human accountability toward nature
3. Connecting local ecological history with global sustainability issues

This paradigm transcends the dichotomy between human history and natural history, aligning history education with the goals of Education for Sustainable Development (ESD) as promoted by (Unesco, 2019). To address this gap, the study was guided by the following research objectives: to examine how the implementation of Green History Pedagogy influences students' ecological historical consciousness in senior high school history learning (Sariyatun et al., 2025). It positions the history classroom not only as a space for cognitive learning but also as a place for ethical and ecological

This study aims to examine the effects of implementing Green History Pedagogy on senior high school students' ecological historical consciousness in history learning. In particular, the study explores how Green History Pedagogy is enacted within the local context of Jember and how place-based, critical, and postcolonial-oriented historical inquiry supports students in understanding the interconnections between past, present, and future through an environmental lens. To achieve this purpose, the study investigates the ways teachers design and facilitate Green History Pedagogy-informed learning activities and analyzes the extent to which these activities influence students' ecological historical consciousness. It further examines which dimensions of this consciousness develop most prominently, such as students' ability to reconstruct historical narratives by incorporating environmental elements, reflect on human accountability toward nature, and connect local ecological histories with broader sustainability issues. Finally, the study considers students' perceptions and learning experiences during place-based activities (e.g., fieldwork, community mapping, and archival inquiry) as an integral part of understanding how Green History Pedagogy contributes to the formation of ecological historical consciousness.

METHOD

Research Design

This study employed a *Mixed Methods Research* (MMR) design with a dominant qualitative orientation. The justification for using MMR lies in its capacity to provide qualitative interpretive

depth alongside quantitative validation breadth (Creswell & Poth, 2017).. The qualitative component examined the experiences of teachers and students in implementing Green History Pedagogy. Meanwhile, the quantitative component complemented these findings by providing survey data on students' ecological and historical awareness.

This investigation was structured as a classroom-based pedagogical experiment, integrating cycles of planning, implementation, observation, and reflection. The design aligns with the principles of educational action research and transformative pedagogy (Kemmis et al., 2014), emphasizing the active participation of teachers and students in reconstructing educational practice.

In the MMR design, qualitative data were collected and analyzed first to guide the development of quantitative instruments. Integration occurred during the data interpretation and discussion stages, ensuring that numerical trends were contextualized within qualitative insights.

Figure 1.

Research Flow

Research Site and Participants

The study was conducted in three senior high schools located in Jember Regency, East Java, Indonesia, representing urban, semi-urban, and rural ecological settings. The schools were purposively selected to capture diverse socio-environmental contexts relevant to the historical

themes under study (e.g., plantation economy, agricultural ecosystems, and river basin communities).

Participants included 3 history teachers. The study involved three history teachers (two males and one female) aged between 35 - 40 years. Their teaching experience ranged from 10 to 15 years, with an average of 15 years. All teachers had formal training in history education and were actively teaching at the senior high school level at the time of the study. who acted as practitioner-researchers and co-designers of the Green History Pedagogy lesson plans; 90 students (aged 16–18), distributed across the three schools, who took part in experimental learning sessions; and 3 school principals and 2 local cultural figures, who were involved as supporting informants for contextual validation.

Development of the Pedagogical Intervention

The intervention consisted of three collaboratively designed learning modules, each lasting 3–4 weeks:

1. Colonial Plantations and Environmental Transformation: Examining the ecological impact of Dutch plantation policies.
2. Local Ecological History of *Gumuk* and River Basins: Integrating oral history and environmental field observation.
3. From Exploitation to Sustainability: Engaging students in reflective discussions and creative storytelling about ecological futures.

Each module applied the core principles of Green History Pedagogy: contextual learning, critical dialogue, and ecological reflection. Learning activities combined archival research, field observation, and historical-ecological mapping, encouraging students to reinterpret colonial narratives through environmental perspectives.

In all modules, educators assumed a facilitative stance, fostering discussion, exploration, and contemplation instead of merely disseminating information. Instructional activities encompassed document scrutiny, cooperative group tasks, on-site observations, introspective writing, and artistic endeavors. Student progress was evaluated via reflective diaries, active classroom involvement, and ecological awareness surveys conducted prior to and following the intervention.

In summary, the pedagogical initiative was conceptualized as a transformative educational encounter, empowering learners to reconceptualize history as a continuous interplay between human communities and the natural world. Through the incorporation of ecological narratives into historical instruction, the initiative synchronized historical education with sustainability objectives and facilitated the cultivation of ecological historical awareness.

Data Collection Methods

To ensure triangulation, data were collected through multiple sources and instruments (Table 1, see appendix):

Data Analysis

Qualitative Analysis

Qualitative data were analyzed using thematic analysis (Braun & Clarke, 2006). The process included:

1. Data familiarization (reading transcripts and field notes)
2. Initial coding (identifying recurring ideas related to ecological awareness, historical empathy, and critical reflection)
3. Theme development (grouping codes into categories representing pedagogical transformation)
4. Interpretation (connecting themes to the theoretical constructs of Green History Pedagogy)

To enhance credibility, member checking was conducted with teachers and participants, and peer debriefing was performed with two external experts in history education.

Quantitative Analysis

Quantitative data from the questionnaires were analyzed using descriptive statistics and paired-sample t-tests to measure differences in students' ecological awareness and historical sensitivity before and after the intervention (Talikan et al., 2025). The results were used to triangulate qualitative findings and identify patterns of cognitive or attitudinal change. This study ensured reliability and validity through rigorous methodological procedures. Questionnaire items and internal consistency were verified using Cronbach's alpha. Content validity was ensured through expert judgment, while construct validity was supported by the theoretically grounded dimensions of ecological awareness and historical sensitivity. Internal validity was strengthened using paired-sample t-tests to assess changes before and after the intervention. Furthermore, methodological triangulation between quantitative and qualitative data enhanced the robustness and credibility of the findings.

RESULTS

Overview of Implementation

The implementation of Green History Pedagogy in three senior high schools in Jember Regency demonstrated that integrating ecological narratives into history learning is both feasible and impactful. Teachers collaboratively redesigned their lesson plans to include local ecological themes such as colonial plantation systems, *gumuk* (mounds), and river basin histories. Each module was implemented through three learning cycles involving field practice, document analysis, and student reflective journals.

Observation data revealed that teachers initially faced challenges transitioning from textbook-based teaching to contextual and ecological approaches. However, through collaborative planning and reflection, they began facilitating more dialogical and critical learning environments. Students responded positively to lessons that connected history with the real environmental realities around them.

As one teacher (T1) described:

"Usually, history is about memorizing dates and heroes. But when students explored the history of Gumuk and saw its environmental impact, they became emotionally and critically engaged."

This indicates that Green History Pedagogy encouraged teachers to shift their instructional role from content transmitters to facilitators of ecological awareness and critical reflection. Rather than focusing solely on the delivery of historical facts, teachers guided students through inquiry-based discussions, source analysis, and reflective activities that emphasized the relationship between historical processes and environmental change. This pedagogical shift fostered a more dialogical classroom environment, enabling students to construct historical–ecological understanding actively and to engage critically with sustainability issues rooted in local and historical contexts.

Transformation of Historical Consciousness

The primary qualitative finding was the emergence of ecological historical consciousness among students. Before the intervention, most students viewed history as a series of political and military events. Afterward, they began recognizing the interdependence between human actions, natural resources, and ecological change.

Student journals clearly reflected this shift. One student wrote:

"*Now I realize that the colonial system not only exploited our labor but also transformed our land, forests, and way of life."*

Through such reflections, students demonstrated eco-critical reasoning—the ability to connect historical narratives with ethical and ecological implications.

This finding supports (Braun & Clarke, 2006). concept of historical consciousness, expanded here into a green dimension. By linking history with environmental consequences, students moved from a chronological understanding of the past to a reflective, moral, and ecological interpretation. This shift aligns with (Gruenewald, 2003). theory of place-based critical pedagogy, which argues that connecting learning to local contexts fosters not only knowledge but also social and ecological responsibility.

Pedagogical Shifts Among Teachers

Teachers' perspectives also reflected a significant pedagogical transformation. Initially, they viewed environmental topics as peripheral to history teaching. After participating in the collaborative module design, they began to see environmental history as integral to local historiography.

Teacher interviews revealed three major pedagogical shifts:

1. From content delivery to dialogue: Teachers facilitated discussions linking colonial exploitation with ecological change.
2. From abstract learning to experiential learning: Field visits to plantation sites and *gumuk* areas helped students visualize environmental transformations.
3. From anthropocentric to ecocentric narratives: Teachers reconstructed local historical stories to highlight nature's role as an active historical agent.

These shifts echo the framework of transformative learning for sustainability, emphasizing reflective practice and systemic awareness.

Changes in Ecological Awareness

Quantitative data from 90 students indicated a measurable increase in ecological awareness following the intervention. Using a 25-item Likert questionnaire, the average ecological awareness score rose from 3.18 (SD = 0.42) on the pre-test to 4.02 (SD = 0.37) on the post-test.

Paired-sample t-tests confirmed that this increase was statistically significant ($p < 0.01$).

Table 2.

Paired-sample t-tests data results

Dimension	Pre-Test Mean	Post-Test Mean	Difference	Significance
Environmental Responsibility	3.25	4.10	+0.85	$p < 0.01$
Historical-Ecological Reflection	3.05	4.00	+0.95	$p < 0.01$
Local Environmental Connection	3.23	3.97	+0.74	$p < 0.05$

These findings confirm that Green History Pedagogy not only enriched historical understanding but also enhanced students' ecological sensitivity and responsibility. The improvement in "Historical-Ecological Reflection" suggests that history can serve as a bridge between past narratives and future sustainability actions. These findings demonstrate that Green History Pedagogy not only deepens students' understanding of history but also significantly increases their ecological sensitivity and sense of environmental responsibility. These improvements demonstrate that incorporating an environmental perspective into history learning allows students to view historical events not simply as past events but as processes deeply intertwined with the relationship between humans and the environment. This teaching approach fosters a more holistic form of historical awareness, incorporating both ecological impacts and ethical considerations.

The clear boost in Historical–Ecological Reflection shows that teaching history can act as a conceptual link between old environmental practices and today's sustainability issues. By carefully examining how land was used, resources were managed, and the environment changed over time, students developed the ability to think about long-term ecological effects and connect historical stories to decisions about the environment now and in the future. This fits with ideas from historical thinking and education for sustainable development, which stress ongoing connections through time and ethical duties across generations.

Plus, the findings reveal that Green History Pedagogy promotes transformative learning, pushing students beyond mere memorization to develop thoughtful, action-focused insights. The stronger sense of ecological responsibility points to a shift in students' mindsets, in which lessons from history shape values that support the environment and the actions they might take. As a result, this method makes history education a key tool for building citizenship focused on sustainability, proving its importance in tackling today's environmental problems.

DISCUSSION

The findings reinforce the central argument of this study: shifting from colonial to ecological narratives in history education can fundamentally transform both teachers' pedagogical practices and students' historical consciousness. Colonial narratives emphasize human progress through domination over nature, territorial expansion, and industrial growth as markers of civilization (Bonneuil et al., 2016). In contrast, ecological narratives emphasize interdependence, stewardship, and sustainability, positioning humans as part of nature (Chakrabarty, 2021). The empirical results of this study suggest that such a narrative shift can reorient both instructional practices and student reflection toward more ecologically grounded forms of historical understanding.

In Jember, this transformation holds particular significance. The colonial legacy of plantation capitalism left enduring ecological changes, deforestation, soil degradation, and social inequality that continue to shape local landscapes and livelihoods (Lukas & Peluso, 2019; Peluso, 2009). By critically engaging with this historical trajectory, students demonstrated increased historical empathy and ecological ethics, recognizing that past human actions have long-term environmental repercussions (Moore, 2015; Warde et al., 2018). Viewing history through an ecological lens enabled students to identify continuities between colonial exploitation and contemporary environmental crises, fostering a sense of responsibility toward social and environmental justice.

From a pedagogical standpoint, this transformation aligns with Chakrabarty (2021) notion of planetary history, which repositions humanity within the broader dynamics of the Earth system. It also resonates with ecopedagogical approaches in history education that emphasize local knowledge, contextual learning, and critical reflection (Supriatna, 2019). In this sense, Green History Pedagogy operates at the intersection of environmental education and historical inquiry, redefining the history classroom as a space for critical ecological dialogue and ethical engagement (Hollstein & Smith, 2020; Jickling & Sterling, 2017). This orientation situates the approach firmly within the tradition of critical pedagogy, which conceptualizes education as a practice of emancipation and a pathway toward ecological justice (Binawan, 2023; Freire, 1970; Giroux, 2011).

At the same time, the findings must be interpreted with careful attention to methodological constraints. The use of a single-group pre–post design without a control group limits the extent to which causal inferences can be drawn regarding the specific effects of Green History Pedagogy. Although increases in ecological awareness and historical reflection were observed, these changes may also reflect contextual influences or developmental factors. Additionally, the reliance on self-reported questionnaires and reflective journals introduces the possibility of social desirability bias, particularly given the normative appeal of sustainability-related issues.

The relatively short duration of the intervention and assessment period further restricts the conclusions that can be drawn. While short-term improvements in ecological awareness and

historical sensitivity were evident, the study does not address the persistence of these changes or their translation into long-term behavioral outcomes. Moreover, although the research instruments were grounded in theory and reviewed by experts, the scope of instrument validation was limited, and additional psychometric testing with larger samples would enhance measurement reliability and validity.

The small-scale, non-representative nature of the sample, comprising three schools and a limited number of teachers, also constrains the generalizability of the findings. As such, the results should be understood as context-specific insights rather than universally applicable conclusions. Differences in institutional conditions, teacher expertise, and local ecological contexts may lead to varying outcomes in other educational settings (Damoah & Adu, 2022; Sund & Lysgaard, 2013).

Despite these limitations, the study provides meaningful exploratory evidence supporting the educational value of integrating ecological narratives into history teaching. In line with prior research on inquiry-based and place-based pedagogies (Cutter-Mackenzie-Knowles et al., 2020; Gruenewald, 2003; Stevenson, 2007), The findings suggest that connecting historical content to students' lived environmental experiences can enhance engagement and deepen critical reflection. Importantly, the study demonstrates the potential of history education to contribute substantively to Education for Sustainable Development by linking historical understanding with contemporary and future environmental concerns (Sterling, 2010).

In conclusion, while the results warrant cautious interpretation, they highlight the epistemological and pedagogical significance of Green History Pedagogy. By recontextualizing history as a field concerned with human–nature relationships, this approach moves beyond commemorative or nationalistic narratives toward ethically grounded and ecologically informed inquiry. Future research employing longitudinal designs, comparative control groups, and broader cross-regional samples is needed to substantiate further and extend these findings. Through such continued investigation, Green History Pedagogy has the potential to develop into a robust framework for addressing contemporary ecological challenges through historical education.

CONCLUSION

This study concludes that implementing Green History Pedagogy in senior high school history learning in Jember significantly transformed both teachers' instructional approaches and students' ecological historical consciousness. Through a mixed-methods framework combining classroom observation, interviews, reflective journals, and ecological awareness surveys, the study found that integrating ecological narratives into history learning encouraged students to critically connect colonial pasts with contemporary environmental issues.

The shift from colonial to ecological narratives redefined the purpose of history education—not merely to commemorate events or national heroes but to cultivate eco-critical awareness rooted in local realities. Students learned to interpret history as a dialogue between

human society and nature, recognizing the enduring impacts of colonial exploitation on landscapes, communities, and environmental ethics. Meanwhile, teachers reoriented their pedagogical roles from knowledge transmitters to facilitators of reflective and contextual learning.

This study is subject to several limitations. The research was conducted in a localized educational context, which may restrict the generalizability of the findings. The relatively short intervention period and limited sample size constrain the assessment of long-term impacts. In addition, reliance on self-reported instruments may have introduced response bias. Differences in teachers' pedagogical and ecological competencies may also have affected implementation fidelity.

Overall, Green History Pedagogy proved to be a transformative educational framework, aligning historical studies with the broader goals of sustainability education. It contributes to rethinking how history can respond to contemporary planetary challenges by fostering empathy, responsibility, and action-oriented awareness among learners.

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APPENDIX

Tabel 1.

Data Collection Methods

Type of Data	Method	Description	Purpose
Classroom Practice	Observation & field notes	Documented learning interactions, student participation, and use of local context	To analyze pedagogical implementation
Teacher and Student Perspectives	Semi-structured interviews	Conducted with selected teachers and students before and after the intervention	To capture changes in perception and experience
Learning Artifacts	Document analysis, The documentary data comprised official educational documents (curricula, policy documents, and government regulations) and textbooks and learning modules relevant to the research focus.	Analysis of lesson plans, student journals, and project outputs	To assess alignment with Green History principles
Quantitative Component	Ecological Awareness Questionnaire, The Ecological Awareness Questionnaire was developed through a systematic process grounded in theories of environmental literacy and	25-item Likert scale	To measure changes in students' ecological and

	ecological awareness. First, key dimensions of ecological awareness, ecological knowledge, environmental attitudes, and pro-environmental behavior were identified from relevant literature. Based on these dimensions, questionnaire items were adapted from previously validated instruments and refined to suit the local educational context.		historical awareness