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How Can Environmental Education be Incorporated into Indonesian Language Learning? A Critical Review of Teachers' Perspectives

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Abstract. Teachers and students should implement environmental education practices oriented towards sustainable development in schools as one of the solutions to overcominge environmental problems. This research addresses gaps related to teachers' lack of understanding of ecological education, limited resources, and policy support in implementing environmental education by exploring Indonesian language teachers' perspectives using critical reflection and dialogical theory. This research uses an interpretative phenomenological analysis approach to explore the views and experiences of nine junior high school Indonesian language teachers, six women and three men, from various regions. The participant selection technique used purposeful sampling by setting criteria. Data was collected using in-depth interviews and Focus Group Discussions as an additional technique. Findings of this study show that teachers' critical awareness of environmental education is the basis for boosting students' awareness of the ecological impact of human activities. Dialogue between teachers and students is essential in empowering and creating participatory spaces for students to express their views and interests. Challenges and obstacles in environmental education become opportunities for critical reflection for teachers to develop a more contextualized curriculum. The findings of this study show the importance of critical reflection in supporting teachers to be more adaptive and innovative in integrating environmental elements into learning. This could contribute to the experiences and practices of environmental education-based learning conducted by Indonesian language teachers. Future research could involve more teachers from

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different regions and education levels, obtain more representative data and include students' perspectives directly to explore their understanding of environmental education.

Keywords: environmental education; ecoliteracy; Indonesian language learning; critical reflection; teachers' perspectives

1. Introduction

Indonesia's international commitment to environmental and sustainability issues has been realized through various essential steps. It has demonstrated its commitment to environmental responsibility by hosting the UN Conference on Climate Change (UNFCCC COP13) in Bali in 2007, participating in the UN Decade of Education for Sustainable Development (2005-2014), and signing the REDD+ Agreement with Norway in 2011, which aims to reduce emissions from deforestation and forest degradation (Parker, 2017). Indonesia has also acceded to the 2015 Paris Agreement and committed to reducing greenhouse gas emissions by 29% independently, or up to 41% with international assistance by 2030. While Indonesia has demonstrated its commitment in international forums, many implementation challenges —, such as law enforcement and public awareness —, must be addressed to ensure the real impact of these environmental initiatives. Lack of awareness and knowledge about the natural environment and human impacts on nature among the Indonesian population causes unaddressed environmental issues. Public education is, needed to improve environmental awareness (Ramadhan et al., 2024). Sustainability values are not deeply embedded in society, so environmental matter are not considered important. Modern society often ignores them and lacks awareness of the importance of environmental education.

Environmental matter in Indonesia are of concern, so environmental education is essential to educate the younger generation about a sustainable environment. Education contributes to the transfer of knowledge and the formation of people's awareness and responsibility towards environmental and social issues (Hnatyuk et al., 2024). Education is a significant tool for addressing the challenges posed by environmental pollution, biodiversity loss, and climate change. In sustainable development, education, and change, promote a better understanding of environmental matter, social justice, and economic efficiency (Arabadzhyiev et al., 2020). The role of each individual is crucial in maintaining sustainability, including protecting nature and ecosystems, reducing pollution, and adopting sustainable lifestyles. Environmental education is a comprehensive strategy to equip people and communities with the knowledge and skills needed. In many Indonesian schools, understanding environmental education materials regarding the interconnections between society, economy, and environment is still very superficial (Parker & Prabawa-sear, 2020). In addition, many materials focus more on delivering facts about the environment rather than encouraging students to be actively involved in learning and caring for the environment.

Research shows that many countries have integrated environmental education into the formal curriculum, but the level of implementation varies. Countries

like Australia, Finland, and the United States have more mature Environmental Education (EE) frameworks with strong policy support (Stevenson, 2007; Wiksten, 2019). Meanwhile, the main obstacles in developing countries such as Indonesia are lack of teacher training, policy support, and limited resources. Research results from Oztas & Kalipçi (2009) found that prospective teachers (students) in Turkey did not fully understand the concepts of ecology and the environment when answering various questions about their environment. The same thing also happens in Indonesia. Although most teachers know the importance of environmental education, implementation of environment-based learning is still not consistent in all schools in Indonesia.

Ecological literacy, or eco-literacy, is about understanding how humans interact with ecosystems and how this can be done sustainably (Hammarsten et al., 2019). Ecoliteracy is a person's understanding, knowledge, attitude and behavior regarding the importance of global ecological awareness in creating a balance between the needs of society and the universe. Eco-literacy builds awareness of decision-making and information about taking action to address environmental issues (Farahiba et al., 2024). In education, eco-literacy is an important competency for teachers, especially in efforts to integrate environmental education into the curriculum. Eco-literacy must be nurtured and shaped from an early age so that students have an attitude of love for the environment. Environmental education can improve critical thinking abilities and problem-solving skills, thus enabling students to analyze environmental problems, evaluate potential solutions, and consider the long-term implications of their actions (Hasrina et al., 2025). Setyaningrum and Gunansyah (2020) conducted relevant research on this study. The research results showed that eco-literacy learning practices oriented toward sustainable development in public primary schools in the western region of Surabaya City were in the good enough category with a percentage of 41.3%. Similar research was also conducted by Anggraini and Subrata (2024), with results showing students' interest and enthusiasm during their application of problem-based eco-literacy in learning speaking skills, with an acquisition rate of 89.5% or 17 out of 19 students.

Research shows that although many teachers know the importance of environmental education and are well-informed about the environment, the frequency and intensity of environmental implementation in learning are lacking (Cusick et al., 2010; Jatzko, 2016). In practice, the focus is on natural science and rarely on social aspects. Critical reflection is an important tool for teachers to evaluate and improve learning practices, making them more effective in instilling eco-literacy awareness in students (Eschenbacher & Fleming, 2020; Manen, 2023). Teachers tend to do what they do without questioning the assumptions behind their teaching methods. The exchange of information, ideas, and emotions between teacher and students builds effective communication in the classroom (Guo & Asmawi, 2023). This study aims to explore the extent to which teachers reflect on their assumptions and practices of Indonesian language learning, as well as critical reflection, to encourage a change or transformation of their learning. In this study, teachers' critical reflections provide awareness that Indonesian language learning practices that contain

environmental education play an important role in instilling environmental awareness and affecting transformative learning.

Integrating environmental materials into Indonesian language learning has great potential to create holistic and interdisciplinary learning. Students can understand sustainability issues in greater depth through text-based Indonesian materials orientated around environmental issues. Integrating environmental issues in English gives students a global perspective, helping them understand how environmental challenges are interrelated and affect people worldwide (Kamarullah & Yanti, 2024). Environmental education can develop students' language skills, namely reading, writing, speaking, and critical thinking skills, and can enable students to practice the language in authentic contexts, such as through collaborative projects that involve observing or reporting environmental concerns. In addition, multimedia resources and ecological literature in English lessons effectively increase environmental awareness (Hasrina et al., 2025). The practice of developing language skills through the topic of environmental issues leads students to master cognitive, psychomotor, and affective abilities. Students learn about environmental issues such as pollution, recycling, and climate change through environmental texts. Cognitive skills. In language practice, students write reports, make videos, or do presentations on environmental activities, practicing speaking, writing, listening, and reading in an authentic context. Students are directed to build concern for the environment from the affective domain through ecological values-based learning. In turn, environment-based learning is expected to internalize and instill the values of responsibility, collaboration, and empathy towards nature, which are relevant to the Indonesian language education curriculum.

Research on environment-based learning in Indonesia shows that the integration of environmental education is still limited. Existing implementations mainly focus on activities or projects related to the "Pancasila Learner Profile," such as tree planting, school cleaning, and waste reduction campaigns. The experiences and practices of environmental education-based learning conducted by Indonesian language teachers can be the basis for developing a comprehensive implementation of environmental education-based learning. Based on these reasons, this study aims to explore Indonesian language teachers' perspectives on environmental education to see how teachers critically reflect on the assumptions and practices of environmental education-based learning.

2. Literature Review

2.1 What is the State of Environmental Education (EE) in Indonesia?

Environmental Education (EE) was first introduced in the 18th century by Jean-Jacques Rousseau (1921) in his work *Emile: or, On Education* and through hands-on learning methods introduced by Louis Agassiz (Irmscher, 2013). Both contributed to the foundation of EE, which continued to evolve under various designations such as nature study conservation education and eventually became known as Environmental Education (EE). One important milestone in EE was the Tbilisi Conference in Georgia, USSR, in October 1977. The conference resulted in the Tbilisi Declaration, which set out EE guidelines, goals, and

characteristics focused on preserving and improving the quality of the global environment.

Global developments in EE continue with the Millennium Development Goals (2005-2015), including the UN Decade of Education for Sustainable Development (DESD), which prioritizes integrating sustainable development principles in education. Education for sustainable development is an innovative concept that gives new meaning to teaching and learning in a variety of educational settings and, thus, an approach that offers the opportunity to rethink education fundamentally (UNESCO, 2017). EE became part of the Sustainable Development Goals (SDGs) in 2015, specifically through the fourth goal emphasizing quality and inclusive education. Unlike the MDGs, the SDGs approach is more bottom-up, seeing education as key to many goals, including environmental education, education for peace, and vocational education. Based on the Tbilisi Declaration, EE aims to develop students' awareness, knowledge, attitudes, skills, and participation in conserving the environment. In addition, UNESCO and UNEP propose three pillars of EE, namely education about the environment, education in the environment, and education for the environment. These aim to support objectively the implementation of environmental education in Indonesia.

Strengthening environmental education materials for students, especially at the basic education level, is carried out through the national and local curricula or content. Curriculum 2004 and Curriculum 2006 are more advanced in accommodating aspects of EE by allocating time for local content curriculum. Many regions and schools in Indonesia are filling local content with environmental education materials. Cooperation between the two ministries in 1996 was renewed in 2005 and 2010. One of the follow-ups to the 2005 agreement was the development of the Adiwiyata Programme by the Ministry of Environment on 21 February 2006. The program aims to accelerate the implementation of EE at the primary and secondary education levels.

Environmental Education (EE) is defined as the efforts of various parties to change people's behaviors and attitudes to increase their knowledge, skills and awareness of environmental values and issues, so that they can support environmental conservation for the benefit of current and future generations. It aims to affect aspects of knowledge, awareness, behaviour, skills, and participation, which are also expected to be effective tools in shaping the character of the younger generation. According to Araújo et al. (2022), EE is a tool to empower people to make informed decisions about how human activities affect the environment. This type of education examines and tries to change ingrained values and behaviours that cause the planet's natural systems to deteriorate. However, it is crucial to recognize that environmental matters are complex and require diverse approaches.

In Indonesia, efforts to incorporate EE into the national curriculum are made through programs such as Adiwiyata School, which the Ministry of Environment and Forestry introduced in 2006. The program encourages schools to become agents of change in conserving the environment through

environment-based learning activities (Permata & Wibowo, 2023). Although this concept has been implemented in many schools, Eka and Suwarno (2020) note that it is often limited to extracurricular activities and has not been deeply integrated into the core curriculum. Teacher training and competency development are important factors in the transformation of EE. Many teachers feel underprepared to teach environmental topics due to a lack of specialized training. Research by Stevenson (2007) shows that proper training and support from the government can improve teachers' ability to teach sustainability-related material. Teachers will likely struggle to integrate environmental concepts effectively into their daily learning without adequate training.

Transforming EE in Indonesia requires a holistic approach that involves the entire school community and the surrounding community (Sterling, 2009). All elements in the education system—including students, teachers, administration, and the community—have a role to play in creating a sustainability-orientated learning environment. In Indonesia, this approach is beginning to be implemented through collaboration between schools, communities, and local governments in various environmental education programs.

In Indonesia, research on EE that focuses on teachers is still relatively limited. More research focuses on the student level (Ritonga et al., 2024). This raises a question: to what extent do teachers in Indonesia understand EE, and how do they implement it in the learning process? This shortcoming allows for more in-depth research on teachers' EE, especially to understand the challenges and opportunities in improving their competence. Despite the importance of EE, many teachers still do not have a deep understanding of the concept, especially in effectively integrating it into the existing curriculum. Teacher knowledge plays an important role in the successful implementation of both approaches. Teachers who deeply understand environmental issues will be better able to integrate environmental education materials into the curriculum. However, many studies show that teachers often do not feel confident in teaching EE resource due to a lack of formal training in EE, resources, teaching materials policy support in many places (Hidayanti et al., 2018; Kadorodasih, 2017) .

Approaches that integrate second language acquisition with engagement in real-world matters not only improve language proficiency, but also deepen understanding of global environmental challenges, and motivate proactive engagement (Nkwetisama, 2011). Moreover, primary school students' early experiences with EE have the potential to shape their lifelong attitudes and actions toward nature (Torkar, 2014). By incorporating environmental themes in their lessons, language teachers can actively contribute to environmental protection and model behavior. Environmental education-based learning is important in Indonesian language learning because it helps students understand the environmental context in language materials, such as literature, poetry, and non-fiction texts. EE strengthens students' literacy skills by critically understanding the environment sustainability. This integration allows students to develop environmental awareness and critical thinking skills while building language literacy skills relevant to facing real-life environmental challenges.

2.2 Theoretical Framework: Paulo Freire's Critical Theory in Environmental Education

From Paulo Freire's Pedagogy of the Oppressed, the influence of the Frankfurt School, particularly the Critical Theory that developed in Germany, is evident. From these theories and principles, Freire formulated many concepts that became known as critical pedagogy. Through this pedagogy, Freire encouraged the restructuring of education as a tool of progressive social change to change the world and its oppressive conditions. Freire starts from the premise that man is only fully human when he has the freedom to choose and express himself. The opposite situation is oppression, which Freire regards as a form of dehumanization. This oppression occurs as a tense relationship between the oppressor and the oppressed, which Freire adapted from Georg Wilhelm Friedrich Hegel's concept of the dialectic of master and slave. According to Freire, oppression is a condition in which one person exploits or restricts another so that they cannot express themselves as responsible individuals (Freire & Shor, 1987). Paulo Freire's critical pedagogy provides a highly relevant framework for analyzing and implementing environmental education. Environmental education can effectively transform and create a more caring and environmentally responsible society with an approach that encourages critical consciousness, dialogue, action, and empowerment.

Paulo Freire's critical theory focuses on critical consciousness or *conscientização*, where education is seen as a means to empower individuals to understand and change their social reality; a education that not only conveys knowledge but also engages students in a process of critical reflection, dialogue, and action (Torres, 2023). Education should raise students' critical awareness of the environmental impacts of various social and economic practices. With this awareness, students understand clinical injustices and actively resolve them (Freire, 2005). In Freire's theory, critical consciousness means deeply understanding social and environmental injustices. Critical consciousness results from deep reflection, allowing individuals to question existing assumptions, values, and practices. Education that integrates critical consciousness can improve students' ability to analyze social and environmental issues and motivate students to play an active role in change. Freire emphasized the importance of dialogue in the learning process and that education should encourage critical consciousness through dialogue, where teachers and students engage in a shared learning process to address problems (Torres, 2023). This process increases critical consciousness and enables students and teachers to develop understanding and capacity for transformation.

In education, dialogue allows for the exchange of ideas between teachers and students, making learning collaborative. In environmental education, Sterling's (2009) points out that dialogue can help students relate sustainability concepts to their personal experiences, thus encouraging them to contribute to conservations about the environment. This dialogue helps students develop critical thinking skills by discussing and solving problems in a social and environmental context. This is in line with the opinion of Rahimi and Sajed (2014) who state that dialog in environmental education allows students to feel they have a role in protecting the environment, not just as passive recipients of information.

For Freire, dialog is an ordinary conversation and an epistemological method for understanding and exploring knowledge in depth. Effective dialog requires epistemological curiosity and openness to critical and reflective thinking, which help students become more independent in thought and action (Freire, 2000). Freire also emphasizes that dialogical education develops students' humanity. When allowed to dialogue and make decisions, students build a sense of attachment to their learning process, ultimately enhancing self-esteem and humanity. Freire believes education is never neutral; it can be liberating or oppressive. A dialogical education model that leads students to think critically and independently helps to create a new human being and a new, more progressive era.

According to Freire, dialogic and democratic environmental education can build students' sense of ownership and responsibility for the environment. Thus, they can reject practices that destroy nature and participate in sustainable social change (Misiaszek, 2019). In Freire's perspective, environmental education is humanizing education, where students are valued as subjects who have a roles in preserving the environment. Teaching students to think critically about environmental concerns helps them develop an identity as individuals empowered to take action to preserve nature and the survival of creatures on earth. Education is one means of changing society. Experiential education allows students to understand and actively participate in social change. Research by Thohiroh et al., (2024) shows that this approach effectively increases student participation in local environmental matters. Using a project-based approach, students learn theoretically and understand the real impact of their actions on the environment.

Critical reflection is a key component in Freire's theory, where teachers and students must continuously evaluate and rethink educational practices. Chan and Lee (2021) emphasize that critical reflection helps educators understand the social implications of their teaching methods and encourages the adjustment of methods to make them more relevant and effective. Critical reflection helps teachers identify limitations in their teaching methods related to environmental education and develop new ways to respond to students' needs and environmental issues. This research explores and investigates the critical reflection of teachers' understandings and experiences, particularly Indonesian language teachers, in implementing EE in Indonesia. This research focuses on the perspective of Indonesian language teachers because they have a strategic role in practicing EE by integrating environmental content or materials into learning activities.

3. Methods

The method used in this research is qualitative with an interpretative phenomenological analysis (IPA) research approach. Interpretative phenomenological analysis (IPA) was deliberately used because the essence of the problem could only be fully understood through the lived experiences of the instructors and involved data coming directly from the participants (Sumalinog, 2022). This approach answers the research questions because it can capture detailed and nuanced experiences of Indonesian language teachers' perceptions

of environment-based learning in Indonesia (Leavy, 2023). This research also emphasizes the interpretation of Indonesian language teachers' narratives and experiences within a broader social, cultural, and historical context. We used a semi-structured interview format to collect data from Indonesian language teachers, allowing them to share their stories and insights in a rich and detailed manner.

3.1 Participants

The researchers selected participants based on specific objectives and criteria to facilitate the exploration and collection of information on the problem posed (Creswell, 2008). Participant were selected using a purposeful sampling technique by setting criteria; Indonesian language teachers with undergraduate education and teaching experience of 1—10 years, who have a teaching certification and are considered to have sufficient knowledge related to environment-based learning. Each selected participant was asked to complete a letter of consent and willingness prepared beforehand. The participants were nine Indonesian language teachers, six women and three men, who participated voluntarily (see Table 1).

Table 1: Participant Demographic Information

Participant Code	Gender	Age	Teaching Experience (years)
P1	Female	35 years old	13 years
P2	Female	33 years old	3 years
P3	Female	52 years old	21 years
P4	Female	47 years old	20 years
P5	Female	46 years old	24 years
P6	Male	48 years old	19 years
P7	Female	46 years old	18 years
P8	Male	45 years old	19 years
P9	Male	43 years old	20 years

The participants in this study are written with the initials P1-P9. The researchers stated that the identity and information provided by the participants would be kept confidential. All participants were Indonesian language teachers aged 33—52 years (mean: 43 years). On average, the participants had 17.4 years of teaching experience. Participants were drawn from schools to compare their experiences in implementing EE-based learning.

In addition to interviews, researchers conducted focus group discussions as an additional technique. Focus group discussion is a technique where researchers gather a group of individuals to discuss a specific topic, aiming to explore participants' complex personal experiences, beliefs, perceptions, and attitudes through moderated interaction (Bryman, 2004; Hayward et al., 2004; Krueger, 2002). This technique explores in-depth information by involving interactive

discussions among a small group of participants to verify and complement data, resulting in relevant and sufficient information. The researchers lead the group discussion with the participants.

3.2 Instrument and Data Collection

In-depth interviews with all participants were used as a data collection procedures in this study. Interviews were conducted face-to-face using interview guidelines that had been prepared beforehand. They were conducted to obtain complete research data as needed. The interviews were semi-structured so that the questions in the interview guidelines could be explored in depth. Semi-structured interviews allowed the researchers to have guiding questions while remaining flexible to explore respondents' answers further. They also allowed the researchers to understand the social context, culture, and personal experiences of the respondents more holistically. The researchers replaced respondents' names with codes or initials to maintain confidentiality. The published data does not include respondents' personal information, such as name, address, or other recognizable identifiers. Before the interviews, the researchers sought written consent from the respondents, which included information about the purpose of the study, the use of the data, and a commitment to maintaining confidentiality.

The interview process was conducted at each participant's school. Interviews were conducted according to a previously agreed schedule and time. We started the interviews by making introductions and then explaining the title and purpose of the research. We asked the informants to answer the questions honestly based on their experiences. We prepared recording devices and answer sheets to record the answers to each question so that each participant's answers could be recorded and documented correctly. Interviews lasted between 30 and 60 minutes for each participant. We interviewed one to two participants each day. The categories of questions referred to subtopics that included: understanding the concept of eco-literacy, experience integrating eco-literacy, reflection on learning practices, attitude towards the environment, evaluation of learning, and critical consciousness. From these subtopics, we developed 12 questions (see Table 2).

Table 2: Reflective Questions for Teachers

Subtopic	Question
Understand the concept of environmental education	What do you understand about environmental education?
	How would you define environmental education-based learning?
Experience integrating environmental education	How do you integrate environmental education concepts into the subjects you teach?
	Do you find linking environmental education concepts to the school curriculum complicated?
Reflection on learning practices	Can you give examples of environmental education-based learning that you have done?

	What do you think works and what needs to be improved in practice?
Attitude towards the environment	What are your attitudes and actions towards environmental issues after understanding environmental education?
	How do you motivate students to participate in environment-related activities actively?
Evaluation of learning	How do you evaluate students' understanding of environmental education?
	What are the biggest challenges in assessing the effectiveness of environmental education?
Student response	How do students respond to your implementation of environment-based learning?
	Do students' responses contribute to instilling the character of environmental care?
	How can integrating environmental education improve student motivation and engagement in learning?

3.3 Data Analysis

We analyzed the empirical data qualitatively. The analysis of this study was based on interpretative phenomenological analysis, and explored teachers' experiences in implementing EE-based learning and involved an in-depth investigation into their perceptions and the meanings they formed from these experiences. This process focused on subjective phenomena, where in-depth interviews explore each teacher's experience in detail. The analysis followed several key stages: (1) repeated reading of the interview data to understand the context, content, and nuances of the experiences presented; (2) initial coding to identify themes that emerged from teachers' experiences in implementing eco-literacy-based learning; (3) thematic themes were used to construct more significant categories from the codes found (Braun & Clarke 2014); (4) phenomenological interpretation to describe experiences and interpretations of their experiences which are often related to social, cultural and dialogical contexts (Nimasari, 2024); (5) application of dialogical theory to understand interactions and social dynamics in teachers' learning practices, where they engage in discussions with students on environmental issues and, (6) critical reflection to evaluate the implementation of eco literacy-based learning methods, relate them to theoretical insights and adapt their approaches to the classroom context.

We classified the data using dialogical and reflective categories within micro-themes: teachers' personal experiences, implementation challenges, and students' responses to learning. We transcribed the interviews and compared them with the feedback responses from each participant to identify similarities and differences. We visualized the data by consistently labeling and marking interview excerpts using a bold font to indicate how the statements fit to

categories (Leavy, 2023). To ensure thorough and consistent analyses, we repeatedly reviewed the research questions, data set, and theoretical framework, moving back and forth between them. The analysis involved familiarising ourselves with the data, making initial categorizations, refining patterns, and producing a final report. The credibility of our data analysis was conducted using researcher triangulation. Researcher triangulation involves multiple researchers independently analyzing the data to reduce personal bias and enrich the perspectives gained from the data. This approach ensured that the findings are more valid and reliable as they were examined through multiple viewpoints, thus increasing the accuracy of the interpretation (Creswell & Clark, 2018).

4. Results and Findings

Three main themes of the findings were identified based on the theme categories of dialogical and reflective perspectives. These themes included teachers' personal experiences, implementation challenges, and students' responses to learning. Each theme involved codes underlying the participants' experiences that reflected the main research questions.

4.1 Finding 1: Teachers' Personal Experiences

Teachers' experience implementing environment-based learning is closely relevant to Paulo Freire's concept of critical consciousness. Critical consciousness refers to an individual's ability to deeply understand social, political, and economic realities and work to change these conditions for the sake of justice. Most teachers demonstrated a critical awareness that environmental education aims to build students' awareness of the environment and enable students to realize the negative impact of human practices on nature. According to Morrell (2018), this critical awareness enables teachers to direct students in identifying and critiquing environmental concerns around them and developing an understanding of the importance of conservation. This is demonstrated through the following information provided by P4.

> *If I have ever implemented environment-based learning, it is on the material of observation report text. So,* ***I ask students to leave the classroom*** *and observe the school environment. Then, they write an observation report text based on the observations made.* (P4. 02.10.2024)

The P4 transcript shows that environment-based learning can be applied effectively, especially in the material of observation report text. Students are invited out of the classroom to observe the school environment. The activity creates a deep interaction between students, teachers, and the environment. By having students observe the surrounding environment, teachers facilitate dialogue about their actual experiences, which encourages active engagement and a better understanding of the environmental context. P4 used a direct observation approach by having students observe the surrounding environment, which aligns with Freire's principle that education should enable students to "read their world." With this activity, teachers not only impart knowledge but also build students' critical understanding of the impact of their behavior on the environment.

Teachers with a critical awareness of environmental education invite students to be directly involved in relevant activities, such as conservation projects or field activities. According to Freire, students' involvement in relevant activities illustrates the concept of *praxis* in education. Masykuroh et al. (2024) found that integrated reflection in EE helps students understand the linkages between academic knowledge and their actual experiences. Some teachers realized that environmental education in schools is often limited to activities outside the classroom without direct integration with the curriculum. The following P1 transcript demonstrates this.

> *Activities related to environmental education that have been carried out are jointly visiting mangrove tourism around the school. All students participated then, and they were happy to be taken for a walk. The activity was done to implement P5.* ***After the activity was*** *over,* ***that was it.*** *I have not linked their activities with the learning materials in class.* (P1, 24.09.2024)

Transcript P1 shows that the visit to mangrove tourism with students was only limited to sightseeing, without any attempt to relate it to learning materials in the classroom. This is evidenced by the sentence, **"After the activity is over, it is over."** This statement shows a lack of critical reflection and connection between the field experience and deeper educational goals, as Freire advocates. From Paulo Freire's critical theory perspective, education should not only be a tool to transfer knowledge but also a means to empower learners to think critically and understand the meaning of their activities, including in EE. The same thing was conveyed by P6, as follows.

> *I have never done it to deliver environmental material. It is just that students have been invited to do activities outside of school, namely planting mangroves in the mangrove area together.* ***Even then, it was in the context of implementing P5****.* (P6, 03.10.2014)

Based on the teacher's statement (P6), the mangrove planting activity was carried out in the context of implementing P5 (Pancasila Student Profile Strengthening Project) without linking it to the material or more profound reflection. The following analysis explains how this activity is seen from the perspective of Freire's theory. Freire considers critical consciousness the primary goal of education, where students realize the impact and importance of their actions on the world around them. In this mangrove planting activity, without critical understanding, students may only see the activity as a school assignment without understanding the larger context. Critical awareness in the context of EE will help students see the importance of mangrove ecosystems, the role of mangroves in protecting coastlines, and their relevance in mitigating the effects of climate change. Without critical consciousness, mangrove planting activities become less meaningful and will not result in sustainable behavior change.

4.2 Finding 2: Teacher Implementation Challenges

Critical reflection can help teachers to evaluate their practices and identify barriers. However, reflection is seen as a process of thinking, evaluating, and

understanding existing experiences, planning future experiences, and is an integral component of self-knowledge and self-regulation, enabling individuals to evaluate, monitor, and improve themselves (Chan & Lee, 2021)

> *So far, we have been using textbooks from the government.* ***We have never used other books. If there are books that are by the local potential of the region, it would be perfect.*** *We hope not only one material but all of them. We are waiting for the results.* (P7, 02.10.2024)

Interview transcript P7 shows that teachers want more dynamic interaction between the material taught and the local context. Reliance on government textbooks limits exploration and deeper understanding of matters relevant to the neighborhood. Teachers can share ideas and experiences through dialog, developing more contextualized materials. In the context of reflective theory, this statement reflects teachers' awareness of the limitations of existing teaching approaches. By reflecting on their experiences, teachers realized the need for additional resources that reflect local potential, encouraging a more holistic approach to environmental education. P1 raised the challenge in terms of students.

> ***The challenge we face in implementing environmental education is students.*** *Students have diverse characteristics and traits, making it difficult for us to design learning that suits their wants and needs. Students sometimes find it difficult to get involved in activities related to the environment.* (P1, 24.09.2024)

P1's transcript shows that the challenge in implementing EE relates to the lack of productive dialog between teachers and students. Students' diverse characteristics require a more inclusive and collaborative approach, where teachers can listen to students' needs and perspectives to design more appropriate learning. Teachers need to reflect on exploring alternative strategies more responsive to student's needs and find ways to increase their participation in environmental activities.

P8 raised a challenge related to the lack of training in environmental education.

> *Our* ***difficulty is integrating environmental content into learning materials.*** *So far, we do not have enough knowledge and understanding to implement this environmental education-based learning. Why? Because there has been no direct socialization from the government. We hope that there will be resource persons presented at the next activity.* (P8, 04.10.2024)

Transcript P8 shows how teachers' incomprehension and lack of knowledge suggest that dialogue and collaboration between the government and educators is crucial. Direct socialization can open up space for more productive interactions and help teachers feel better prepared to implement EE. According to Freire, socialization and training are essential as they open space for teachers to dialog and learn, increasing their capacity to teach complex material.

4.3 Finding 3: Student Response to Learning

Dialog allows students to be active subjects in learning, not just passive recipients. Freire emphasized the importance of dialog in education to facilitate a constructive exchange of ideas. The teachers demonstrated dialog with students in planning learning activities, as shown by the following interview results.

> *I have implemented environmental education-based learning for procedure texts. I differentiated learning by distributing questionnaires to students about their interests and the topic of the procedure text they wanted to create. Then, I asked them to make a video and upload it on Instagram. The result was good; students were enthusiastic about the method.* (P5, 02.10.2024)

The transcript of the interview with P5 shows that students' positive responses to environment-based learning are implemented through dialog, practical activities, and creativity. The teacher asks students to choose a procedure topic of interest and make a video uploaded to social media, using dialog to find out students' interests before the learning starts. This dialog creates active involvement and makes students feel they have a role in the learning process, a fundamental principle of Freire's critical theory. In addition, the dialog between teachers and students aims to build participation and social responsibility. Through dialog about environmental concerns, teachers can help students understand the importance of actively protecting the environment. The following interview results support this.

> *Usually, the **children are happy** when invited to activities outside of school, such as visiting mangrove tourism and planting mangroves together. Children often ask when they can go out again like that.* (P3, 25.09.2024)

P3's transcript showing students' enthusiasm in out-of-school activities, such as mangrove visits and planting, can be analyzed as a sign of student interest that needs to be harnessed and further developed in environmental education. Authentic experiences are an important part of *praxis* in Freire's theory, where students reflect on their experiences to develop critical understanding and take action. Freire argues that education is not just a means for knowledge transfer but also an empowerment process where students actively engage, reflect on their experiences, and develop a critical understanding of the world around them. In addition, transcript P9 shows the same thing.

> *The students had done a market clean-up activity. They were very excited to participate in the activity. After returning to class, **they made slogan texts and posters according to their interests. Those who like words can choose slogans, while those who like drawing can choose posters. The results of their work were terrific. It was good and valuable because I told them to paste it on the classroom wall.*** (P9. 04.10.2024)

Transcript P9 shows that activities such as the market clean-up and the creation of slogans and posters can build students' critical awareness and sense of responsibility toward the environment. Such activities motivate students through real action and allow them to reflect on the experience in the through creative work. In Freire's perspective, creativity in education serves as a tool to give voice to students' critical thinking and gives them space to express their understanding of environmental matters. The freedom to choose to create slogans or posters also reflects an approach that values students' individuality, where they can choose the way that best suits their interests to convey environmental messages. This shows that they are not only recipients of information but also active and reflective creators.

5. Discussion

We express our findings in three main themes identified under the theme category of Freire's critical perspective. These themes included teachers' personal experiences, challenges in implementation, and students' responses to environment-based learning. The findings show that teachers' experiences implementing EE-based learning are diverse. Teachers with critical consciousness tend to be more innovative in their teaching approaches, combining ecological education with other subjects, such as language or science. Education encourages teachers to make conscious choices ('choosing'). One of those choices is to be ethical in their thoughts and actions, consider the morality of each situation that affects their practice, and develop ethical solutions to problems encountered (Benade, 2015) .

A reflective culture requires teaching, modeling, collaboration, and leadership commitment, ultimately improving educators', children's, and families' understanding (Hickson, 2011; Indrašienė et al., 2023). Critical reflection helps integrate personal experience with new knowledge, fosters a deeper understanding of self and environment, and promotes social responsibility and adaptability. The teachers who engage in active reflection could see gaps in their teaching and adapt their practice to create more meaningful and relevant learning. Teachers' main challenges in implementing EE were limited resources and lack of institutional support. Teachers need more freedom and support to develop teaching materials appropriate to the local context and current environmental concern. Learning based on local potential (local wisdom) makes students more independent. It provides opportunities to explore their abilities, both in terms of prior knowledge and beliefs about the concept of the subject matter (Hairida, 2012; Probosari et al., 2021). To improve students' understanding of the environment, the teacher must be able to relate the daily problems of the surrounding environment or existing concepts to the learning content to be discussed. This is in line with the opinion of Gagne and Berliner (Wena, 2009), that if learning content is associated with something known or previously learned in learning activities, students will be more motivated to learn.

In addition, P1 revealed difficulties in motivating students with diverse characteristics and interests, reflecting the challenges of creating a productive dialog between teachers and students. According to Vygotsky (1978) effective

social interaction is necessary to shape students' understanding, and teachers need to create an inclusive and collaborative approach. Teachers need to adapt their teaching methods to be more responsive to student's needs, which can be done through critical reflection. By reflecting, teachers can explore alternative strategies that are more responsive to students' needs and find ways to increase their participation in environmental activities.

Another challenge faced is the lack of training and socialization for teachers. Rahmawati et al. (2020) and Tilbury (2006) mention that in many countries, similar challenges arise when teachers lack adequate knowledge and skills to support sustainable education. Because of inadequate training, teachers lack the knowledge and skills to implement environmental literacy-based learning. Teachers often feel isolated in their efforts to integrate environmental education-based learning without adequate training. Dale et al. (2020) add that the lack of training directly affects teachers' skills in connecting teaching materials with local contexts relevant to sustainability. Stronger socialization and support from the government could facilitate more effective learning by providing teachers with teaching materials, evaluation tools, and collaboration platforms. Malone (2018) and Stevenson (2007) also highlight the need for contextualized training that enables teachers to adapt their teaching methods to the environmental issues around them, thereby increasing student engagement.

Students' responses to EE-based learning also greatly influence teachers' reflections. Students will more easily understand the learning involving direct experience (Bartle, 2015). Experiential learning shows that students who participate in activities outside the classroom, such as tree planting or visiting a mangrove forest, will be more enthusiastic and engaged in the learning material. This is reinforced by Dale et al.(2020), who show that students give better results when actively participating in activities such as planting mangroves or cleaning the environment.

For example, P4 asked students to observe the environment and write an observation report, creating a dialog between students, the environment, and the teacher that deepens students' understanding of environmental matters. Engaging students in real-life contexts provides students with more meaningful experiences. Wiksten (2019) reveal that various studies have consistently concluded that learning which raises factual problems can increase long-term knowledge retention and accurate application of knowledge. This is relevant in EE, where fact-based approaches and factual matters can significantly impact students' understanding of environmental concepts and the application of sustainability values in everyday life. Real contexts increase cognitive engagement, making information more memorable than rote learning. Students learning through real problems are more likely to relate the information to personal experiences, strengthening long-term memory.

Freire stated that education should promote social transformation. Practical activities carried out by teachers, such as mangrove planting, environmental observation, and market cleaning, provide opportunities for students to play an active role in social change. By understanding the direct impact of these

activities, students are expected to internalize the values of sustainability, which in turn can motivate them to act more responsibly toward the environment. Teachers who critically reflect can identify weaknesses in their approach and look for innovative ways to improve the effectiveness of learning environmental education. For example, teachers who combine EE with other subjects show flexibility in their teaching methods and endeavor to relate environmental matters to different areas of knowledge. This reflection is in line with Freire's view that education should always be evaluated and developed to better suit the context and needs of students.

6. Conclusion

This research highlights the importance of critical reflection and dialog in integrating environmental education into Indonesian language learning. Teachers who engaged in critical reflection demonstrated the ability to relate teaching materials to the local context, creating more relevant and meaningful learning. The main challenges in implementation include limited resources, lack of training, and minimal policy support. However, students' positive responses to environmental-based learning, such as their enthusiasm for practical activities, show the great potential of this approach to increase environmental awareness. With education policy support, teacher training, and the development of relevant teaching materials, EE can be a transformative tool to create a generation that is conscious of sustainability.

This research develops Freire's critical pedagogy approach in EE, emphasizing dialog and crucial consciousness as tools for student empowerment. The integration of reflection in language education is essential to create more meaningful and relevant learning. It indirectly extends the concept of ecological literacy into Indonesian language learning, showing how environmental literacy can be integrated with language literacy. This research contributes to the experiences and practices of EE-based learning conducted by Indonesian language teachers. It is expected to be the basis for developing a comprehensive implementation of EE-based learning. This research also shows that environment-based learning helps students understand environmental concerns through direct experience, such as environmental observation and practical activities. In addition, this research provides guidelines for Indonesian language teachers in integrating EE into learning, primarily through critical reflection and dialogical approaches. Based on this study's results, teachers are expected to use teaching materials relevant to the local context to improve students' understanding. Cooperation between the government, schools, and local communities is essential to ensure the sustainability of EE-based learning. Collaboration between teachers, students, and communities in the teaching and learning process can strengthen shared understanding of environmental matters and create a more sustainability-conscious society. Support from various parties can provide resources, develop curricula, and create outdoor activities that support learning based on environmental education.

7. Recommendations and Limitations

This study hads several limitations. Firstly, this study only involved nine Indonesian language teachers from a particular region, so the results cannot be

generalized to all educational contexts in Indonesia. The main focus of this study was teachers, while students' perspectives were only conveyed through teachers' responses. Secondly, this study shows that a limited lack of resources such as teaching materials and teacher training limits the extent to which the results of this study can be applied. Thirdly, the research approach used interpretative phenomenology, which requires subjective interpretations that may be influenced by researcher bias. Based on these limitations, some recommendations are suggested for future research. Future research could involve more teachers from different regions and education levels to obtain more representative data and include students' perspectives directly to explore their understanding of EE. Following up on the results of this study, the development of environment-based modules or curricula that are more relevant to the local context can be considered. Research with a longitudinal approach is needed to evaluate the impact of EE on students' awareness and behavior in the long term. In addition, further research could involve the government and educational institutions to explore the policies and support needed to implement EE.

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Appendix 1

Table 2: Reflective Questions for Teachers

Subtopic	Question
Understand the concept of environmental education	What do you understand about environmental education?
	How would you define environmental education-based learning?
Experience integrating environmental education	How do you integrate environmental education concepts into the subjects you teach?
	Do you find linking environmental education concepts to the school curriculum complicated?
Reflection on learning practices	Can you give examples of environmental education-based learning that you have done?
	What do you think works and what needs to be improved in practice?
Attitude towards the environment	What are your attitudes and actions towards environmental issues after understanding environmental education?
	How do you motivate students to participate in environment-related activities actively?
Evaluation of learning	How do you evaluate students' understanding of environmental education?
	What are the biggest challenges in assessing the effectiveness of environmental education?
Student response	How do students respond to your implementation of environment-based learning?
	Do students' responses contribute to instilling the character of environmental care?
	How can integrating environmental education improve student motivation and engagement in learning?