

ECOLOGICAL EDUCATION IN ELT; HOW COULD IT PROMOTE STUDENTS' CRITICAL THINKING SKILL AND SUSTAINABLE BEHAVIOUR?

¹*Ana Maghfiroh, ¹Bambang Harmanto, ²Harun Joko Prayitno, ³Agusti Tamrin, ¹Lathifah

¹English Education Department, Universitas Muhammadiyah Ponorogo, Indonesia

²Indonesian Language and Literature Education, Faculty of Teacher Training and Education, Universitas Muhammadiyah Surakarta, Indonesia

³Universitas Sebelas Maret, Surakarta, Indonesia

*Corresponding Author Email: ana_maghfiroh@umpo.ac.id

Article Info

Article History

Received: January 2025

Revised: March 2025

Published: April 2025

Keywords

English language teaching;

Ecological education;

Critical thinking;

Sustainable behaviour;

ELT materials;

Abstract

Education has been recognised as a fundamental part of local, national and international efforts to bring about environmental sustainability. However, some schools are confused to integrate it in school program and to raise students awareness towards the environmental issues. The purpose of this study is to explore the integration of ecological education (Eco-Edu) in English Language Teaching (ELT) materials and its role in promoting students' critical thinking and sustainable behaviour. This research employed a descriptive qualitative method. For triangulation data, the researchers combined qualitative data from interviews and quantitative data from questionnaires. The respondents of this study were teachers from five different schools which have integrated the ecological theme in ELT materials. Five informants from five schools were interviewed extensively to collect qualitative data. The interviews were analyzed through thematic analysis using ChatGPT application tools. The findings of this study indicated that teachers were able to integrate the environmental education by applying various ecological themes in ELT materials which could promote the students' critical thinking and raise their sustainable behavior. Teachers noted that students became more proactive in environmental initiatives, such as waste management and tree planting, reflecting a greater awareness of ecological concerns. Moreover, the study highlighted the importance of institutional support and teacher preparedness in successfully implementing Eco-Edu. Ultimately, the integration of Eco-Edu in ELT not only improved language skills but also cultivated a sense of responsibility toward the environment, equipping students with the knowledge and motivation to address global ecological challenges.

How to cite: Maghfiroh, A., Harmanto, B., Prayitno, H.J., Tamrin, A., & Lathifah, L. (2025). Ecological Education in ELT; How Could It Promote Students' Critical Thinking Skill and Sustainable Behaviour?, *JOLLT Journal of Languages and Language Teaching*, 13(2), 1005-1015. DOI: <https://doi.org/10.33394/jollt.v13i2.14330>

INTRODUCTION

Much attention has been paid to pedagogies and curriculum relating to environmental sustainability, yet little research consider how it is integrated into school curriculum and learning process. UNESCO has established the Sustainable Development Goals (SDGs) program, which covers various important aspects, one of which is climate change or climate action. As part of this initiative, the Green School program was introduced as one of the strategies to integrate ecological awareness into education (Kolenatý et al., 2022). This program aims to create more environmentally friendly schools and involve students in nature conservation efforts (Rushton et al., 2023). Through this approach, it is hoped that the

younger generation can be more sensitive to environmental issues and actively participate in preserving the earth.

In Indonesia, the implementation of the Green School program is mandated by Minister of Environment and Forestry Regulations Number 52 of 2019 on the Environmental Care and Culture movement in Schools (PBLHS) and Number 53 of 2019 which aimed at integrating climate education into schools and educational institutions. Through this policy, the Indonesian government seeks to create schools that are not only environmentally friendly, but can also serve as models for the community in implementing a sustainable lifestyle. The LHK Law requires the integration of environmental aspects in various sectors, including education, as part of efforts to reduce negative impacts on nature and increase public awareness of the importance of sustainability. With this legal basis, schools in Indonesia are encouraged to adopt the Green School principle, which include efficient management of natural resources, waste reduction, better energy management, and learning about sustainability that can be applied in everyday life.

Green School programs have also been implemented in various countries as part of global efforts to raise environmental awareness in education. In many developed countries, schools have long integrated sustainability principles in their curriculum, emphasizing wise environmental management and education on climate change (van Velzen & Helbich, 2023). Many schools have adopted project-based teaching methods, where students are directly involved in activities that focus on environmental issues, such as renewable energy maintenance and waste reduction (Dlimbetova et al., 2023). Meanwhile, in developing countries, Green School programs are also being introduced to introduce the concept of sustainable education to students from an early age (Floris, 2022). In these places, the Green School concept is not only applied in facility management, but also in the daily learning process, creating a generation that is more aware of the importance of protecting the environment and supporting broader environmental policies.

The benefits of implementing a Green School program are vast and impact not only on the environment, but also on the quality of education and the well-being of students. Ecologically, schools that implement green principles can reduce their carbon footprint through efficient energy management, waste reduction and water conservation (van Velzen & Helbich, 2023). In addition, with green open spaces and greener facilities, schools can create a healthier and more refreshing environment for students (Dlimbetova et al., 2023). From an educational standpoint, the program provides students with the opportunity to learn first-hand about sustainability and the environmental challenges facing the world today (Widanti, 2022). Through experiential learning, students not only understand theoretical concepts about ecology, but also develop practical skills to address environmental issues. Another benefit is increased social awareness and collaboration, as students are invited to work together on environmental-based projects involving the school community and surrounding communities (Agustin & Acwin Dwijendra, 2023; Maghfiroh et al., 2025).

To ensure the successful implementation of the Green School program, it is important to integrate this concept of sustainability into the existing curriculum and subject matter (Hidayat et al., 2023). One effective way is to include environmental education in English lessons. English teaching not only focuses on developing language skills, but can also be a means to convey sustainability values through texts that address environmental, climate change and conservation issues. Through content-based learning, students can develop their language skills while simultaneously increasing their understanding of the importance of environmental protection (Nur et al., 2022). For example, by analyzing articles, stories or essays on climate change, pollution or sustainability, students can be trained to think critically and understand the environmental impact of various human activities. Thus, English can be an

effective tool to promote ecological awareness and sustainable behavior among students (Ellis et al., 2023).

This article seeks to fill this gap by describing how co-teaching model promotes teachers' professional development by answering three questions. First, What is the importance of integrating Eco-Edu in English language teaching? Second, What is the form of integration of ecological education in English language materials? Third, What is the impact of ecological education in promoting student critical thinking and sustainable behavior? These three questions are answered in the following sections.

RESEARCH METHOD

Research Design

This study aims to explore the integration of ecological education in English Language Teaching (ELT) and its role in promoting students' critical thinking and sustainable behaviour. This research uses a qualitative descriptive design. A qualitative descriptive approach was chosen for this research because of its ability to offer an in-depth exploration of social dynamics are complex and deeply rooted in the educational context. This approach is very suitable for understanding the concept of Eco-Edu integration in ELT materials, because it allows researchers to capture experiences, perceptions and subjective experiences of interactions that promote students' critical thinking and sustainable behaviour.

Different from quantitative methods which relying on numerical data and statistical analysis, qualitative research provides a holistic understanding of the importance and how to integrate Eco-Edu in ELT materials to what impact it will have on students' critical thinking abilities and sustainable behavior. Through descriptive interviews, a qualitative approach allows researchers to explore not only what behavior can be observed but also the underlying motivations and meanings that drive the integration of Eco-Edu in English language learning. For triangulation data, the researchers combined qualitative data from interview and quantitative data from questionnaire.

Research Participants

The respondents of this study were teachers from five different schools in which have integrated the ecological theme in ELT materials. Five informants from five schools were interviewed extensively to collect qualitative data. The interviews were analyzed through thematic analysis and the results were presented descriptively.

Table 1
Code and primary data of participants

No	Code	School level	Position	Gender	Time period handling the program
1	ST1	Junior high	Teacher (PIC of program)	Male	More than 10 years
2	ST2	Junior high	Teacher (PIC of program)	Male	5-10 years
3	ST3	Junior high	Teacher (PIC of program)	Male	5-10 years
4	ST4	Junior high	Teacher (PIC of program)	Female	5-10 years
5	ST5	Elementary	Teacher (PIC of program)	Female	More than 10 years

Instruments

In this study, the researcher used interview and documentation for data collection technique. The interviews and documentation were conducted to explore the integration of ecological education in English Language Teaching (ELT) and its role in promoting students' critical thinking and sustainable behaviour. The interviews were conducted in an unstructured question comprising three inquiries, aiming to gather information on the form of Eco-Edu integration in ELT material, and its role in promoting students' critical thinking, and

sustainable behavior. The interviews were conducted through focus group discussion (FGD). Each interview lasted for 20-25 minutes and the session was recorded. The recording was later transcribed and coded for each theme. While in the documentation, the researcher took some documents and examples of teaching materials used by the teachers in inserting the environmental education themes into the ELT materials.

Data Collection and Analysis

The results of both interview and documentation data were identified and coded based on the theme. The process and stages of data analysis were carried out systematically with a thematic analysis approach. First, the raw data were collected and then transcribed and organized neatly. Second, the data was analyzed by reading and understanding deeply to identify the main themes that emerged. Third, the main themes were identified, and the researcher conducted a coding process to group the data based on these themes. The data that had been grouped was then interpreted to find patterns and relationships between the themes that emerged. The final stage of data analysis is the preparation of a study report that describes the main findings and provides answers to the previously formulated study questions. This analysis aims to provide an in-depth understanding of the benefit of Eco-Edu in English language teaching.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

The importance of integrating Eco-Edu in English language teaching

From the interviews, the English teachers reported that integrating Ecological Education (Eco-Edu) in English language teaching is important. They stated that their students increased their knowledge as well as awareness to protect their environment. These English teachers' answers were highlighted as below.

- (R1) *The integration of Eco-Edu in ELT learning and materials is very important, because talking about the environment means talking about things that are close to students. The rest often see, some even experience, so it is easy to understand.*
- (R2) *The insertion of environmental theme material is very important and relevant when juxtaposed with English texts and materials, especially since the concept of Eco-Edu is very appropriate in the Merdeka curriculum. In accordance with the objectives of the independent curriculum, namely exploring students' potential with environmental assets, the environment can function as a laboratory.*
- (R3) *It is very important and requires more attention because it is related to the future of students and to change mindset and behaviour to be more friendly to the environment, besides creating conditions and climate that support the learning process.*
- (R4) *Eco-Edu is important and needs to be a school concern, so it must be supported by environmentally sound policies, environmentally based curriculum, participatory environmentally based activities, and management of environmentally friendly supporting facilities.*
- (R5) *Integration is very important and not only in the material, but involves learning activities that are able to sensitize students and form environmental care characters.*

Based on the interviews, it is clear that most teachers agree on the importance of integrating Ecological Education (Eco-Edu) into English language teaching. They believe that environmental themes are highly relevant to students' daily lives, making it easier for them to understand and engage with the material. The teachers also highlighted that Eco-Edu aligns well with the goals of the Merdeka curriculum, which aims to explore students' potential through the use of local environmental resources. Furthermore, Eco-Edu is viewed as crucial

for shifting students' mindsets toward more environmentally friendly behaviors and for creating a supportive learning environment.

Integrating Eco-Edu into English language teaching is essential for raising students' awareness of environmental issues and supports the Merdeka curriculum's goals of exploring students' potential through environmental resources.

The form of integration of ecological education in English language materials

From the interviews, the English teachers highlighted that in integrating Ecological Education (Eco-Edu) in English language teaching can be done in various ways. These English teachers' answers were highlighted as below.

- (R1) *Integrate environmental culture in learning activities and relevant materials. Include environmental themes in reading materials: e.g. text about "what happens with our trash" for explanatory or descriptive text materials.*
- (R2) *The integration of Eco-Edu can be in the form of assignments in the form of projects or case studies related to environmental themes, then students are asked to make a report in the form of a table about "cause-effect".*
- (R3) *Using teaching media such as videos on environmental issues. The use of teaching media in the form of videos about phenomena that occur in the environment can provide a clearer picture of Eco-Edu.*
- (R4) *Present the theme of discussion about the environmental theme as part of the learning activity. Students are formed into small groups to directly discuss material such as "asking for and giving opinion" about an environmental theme that they are very familiar.*
- (R5) *Teachers can give project assignments to make posters related to environmental issues, so that students are more creative and active in learning related material, then the posters made can be used as learning resources.*

Table 1
The example of Eco-Edu Integration in ELT

No	Theme	Language Focus	Learning Activities	Ecological Education
1	How Important is cleanliness? How much water do you spend every day?	Analytical Exposition	Listening for details, Reading for main idea, group discussion & collaboration	Water saving and conservation
2	What happens to our trash?	Cause and effect	Explaining how and why something happens, group project to calculate the amount of waste generated in a day and manage plastic waste	Waste management

English teachers have proposed various practical and creative strategies to effectively integrate Eco-Education (Eco-Edu) into English language teaching. One widely recommended method is incorporating environmental themes into reading materials, such as articles or stories focusing on topics like waste management, climate change, water conservation, and biodiversity. These texts not only improve reading comprehension but also expose students to essential ecological issues. Teachers also suggested project-based learning, where students work on real-world environmental problems by conducting case studies, creating campaigns, or organizing awareness programs. Such projects help students apply language skills while developing critical thinking and problem-solving abilities. Additionally, using multimedia resources—such as documentaries, short films, and infographics—enriches the learning

experience by making complex environmental topics more accessible and engaging. Group discussions and debates on environmental themes promote collaboration, speaking fluency, and confidence. Creative tasks like designing posters or writing environmental slogans also foster students' awareness and advocacy. Altogether, these approaches make learning more dynamic and meaningful by combining language acquisition with the development of environmentally friendly attitudes. Eco-Edu not only strengthens students' English skills but also shapes their values and behaviors, preparing them to become more responsible, informed, and proactive global citizens who care about sustainability and ecological well-being.

The impact of ecological education in promoting student critical thinking and sustainable behavior

Regarding with the impact of Eco-Edu, the English teachers revealed that integrating Ecological Education (Eco-Edu) in English language teaching has several impacts on the development of students' critical thinking. These English teachers' answers were highlighted as below.

- (R1) *Students feel more interested and challenged when the teacher invites discussions related to the environment, because they have a background of knowledge about it. Even when the teacher asks them to write, they can tell more details about environmental themes.*
- (R2) *The response of students was very enthusiastic to learn about environmental changes, starting to understand the concept of trees as lungs for schools in the city.*
- (R3) *Students will understand environmental issues such as climate change, deforestation and pollution. To discuss related matters students are very excited and become more critical to find solutions to any existing environmental problems.*
- (R4) *3R activities make students more active and think critically and creatively to sort, think about how to reduce things that produce waste, and think about reuse and processing of the waste produced.*
- (R5) *Students think critically about the causes and effects of phenomena that occur in the environment, about weather changes, their causes, and their effects, to the efforts that can be made to overcome them.*

Teachers observed that the integration of Eco-Education (Eco-Edu) into English language teaching significantly enhanced students' critical thinking abilities. When environmental topics were introduced in class, students demonstrated heightened curiosity and actively engaged in discussions, asking insightful questions and offering thoughtful opinions. Their responses to issues such as climate change, deforestation, and pollution became more analytical, showing an ability to connect cause and effect and to consider broader social and ecological implications. In particular, activities centered on the 3Rs (Reduce, Reuse, Recycle) encouraged students to reflect deeply on their daily habits and to propose innovative, practical solutions for managing waste. Through writing tasks, group discussions, and project-based learning, students practiced evaluating information, making judgments, and defending their ideas—all key elements of critical thinking. Ultimately, Eco-Edu not only deepened their understanding of environmental challenges but also empowered them to think more independently and responsibly about real-world problems.

Besides, the English teachers also revealed that integrating Ecological Education (Eco-Edu) in English language teaching also has several impacts on the development of students' sustainable behavior. These English teachers' answers were highlighted as below.

- (R1) *In the wall magazine was installed articles, poems posters and others related to the environment to make children's concern for the environment increases for example children will not leave trash, and they are like to plant trees. They know Trees can reduce or prevent disasters.*

- (R2) *The impact of Eco-Edu implemented in schools to change the character of students in learning more fun using environmental assets.*
- (R3) *Students actively maintain the cleanliness of the school environment, maintain the beauty of the garden, process waste and reuse waste that can be processed.*
- (R4) *Students become more sensitive to their environment, like to plant in the school garden and participate in maintaining the cleanliness and tidiness of the garden, students also actively participate in maintaining the cleanliness of their class for comfort in learning.*
- (R5) *In the event of a disaster in another area, students actively give attention through donations for the affected area.*

In addition to fostering critical thinking, the integration of Eco-Education (Eco-Edu) into English language teaching significantly influences students' sustainable behaviors. Teachers reported a noticeable shift in students' attitudes and actions, with many becoming more proactive in caring for their environment. Students were observed maintaining school cleanliness, participating in gardening projects, and practicing waste management by sorting and recycling trash. These behaviors indicate not only an increased environmental awareness but also a sense of personal responsibility. Beyond school grounds, some students extended their environmental commitment to community-based actions, such as organizing fundraising events for natural disaster victims and participating in local clean-up initiatives. These activities demonstrate that Eco-Edu nurtures empathy, leadership, and civic responsibility. When environmental themes are embedded in ELT, students are not just learning language skills—they are also developing values and habits that contribute to a more sustainable and socially conscious lifestyle, both in and outside the classroom.

Discussion

Integrating Ecological Education (Eco-Edu) into English Language Teaching (ELT) presents a transformative opportunity to enhance the relevance, depth, and social impact of language learning. In the context of modern educational reforms such as Indonesia's *Kurikulum Merdeka*, which emphasizes holistic character development and real-world applicability, the infusion of environmental consciousness into the English classroom aligns naturally with broader national goals. As noted by Igei et al. (2024) and Triyono et al. (2023), Eco-Edu within ELT fosters the development of environmentally responsible, critically aware, and linguistically competent individuals. This integration not only enriches linguistic competencies but also deepens students' understanding of urgent global challenges such as climate change, pollution, and sustainability. When students encounter these real-life issues within their learning materials, English lessons become more meaningful, making the subject more engaging and personally relevant.

Eco-Edu promotes experiential learning, a pedagogical approach that encourages active engagement and practical application. The concept of the environment as a "living laboratory" invites students to interact with their surroundings through hands-on tasks, such as nature walks, environmental clean-up campaigns, or projects like designing posters about the 3Rs (Reduce, Reuse, Recycle). Nur et al. (2022) emphasize that these experiences embed environmental responsibility into students' consciousness, transforming their awareness into long-term behavioral change. Through such tasks, students not only acquire new vocabulary and language structures but also internalize values of care, sustainability, and responsibility. This dual focus on language and ethics supports a more comprehensive educational experience.

Nonetheless, the successful implementation of Eco-Edu in ELT classrooms does not happen in isolation. As Triyono et al. (2023) suggest, institutional support is crucial for effective integration. Schools must adopt eco-friendly policies and embed sustainable practices into their operational framework. These may include waste segregation, reducing

paper usage, promoting green school campaigns, and encouraging collaboration with local environmental organizations. Such efforts help build an enabling atmosphere in which both educators and learners feel empowered to prioritize environmental education. Teachers, in particular, need administrative backing and access to training programs that familiarize them with environmentally integrated teaching strategies and resources.

One of the practical strategies for embedding Eco-Edu into ELT is through curriculum and material development. According to Khotimah et al. (2025), incorporating relevant environmental themes—such as global warming, water conservation, and deforestation—into reading passages, vocabulary lists, and writing prompts can increase the relatability of classroom content. For example, students might analyze an article about plastic pollution in the ocean, write a persuasive essay on reducing single-use plastics, or engage in debates on the responsibilities of governments versus individuals in mitigating climate change. These activities not only build language proficiency but also sharpen analytical and communicative skills.

Another pedagogical strategy is experiential learning through real-world projects. Chen (2023) notes that activities such as creating eco-campaign posters, participating in recycling initiatives, or even organizing school-wide green movements allow students to apply their English skills in practical, impactful ways. Through these projects, learners develop teamwork, leadership, and critical thinking—skills essential for navigating both academic and social environments. Moreover, by grounding learning in real-life contexts, students see the immediate relevance and utility of the English language, further enhancing motivation.

Multimedia and visual aids also play an essential role in supporting Eco-Edu within ELT. According to Abouelenein et al. (2025), using resources such as educational videos, infographics, and digital storytelling tools helps simplify complex environmental concepts and caters to diverse learning styles. Visual representations of deforestation, carbon footprints, or renewable energy sources can be especially helpful in making abstract terms accessible. This multimodal approach ensures that students not only understand but also retain key ideas, promoting long-term learning outcomes.

A particularly noteworthy benefit of integrating Eco-Edu into ELT is its capacity to foster critical thinking. Environmental issues are inherently complex and multifaceted, requiring students to engage in higher-order thinking. When students are tasked with evaluating the effectiveness of recycling programs, discussing alternative energy sources, or debating the ethics of animal testing, they must assess evidence, weigh different viewpoints, and articulate well-reasoned arguments. As Abello et al. (2021) argue, this deeper engagement enhances learners' motivation and fosters a more meaningful connection with the content. Damayanti et al. (2023) and Nur et al. (2022) also highlight that assignments involving the 3Rs encourage students to explore causes and effects, propose innovative solutions, and collaborate with peers, all of which are foundational components of critical thinking development.

By connecting environmental themes with academic content, Eco-Edu enhances not only cognitive skills but also the students' ability to reflect on broader societal challenges. Loyens et al. (2023) argue that Eco-Edu supports metacognitive growth by encouraging learners to question assumptions, make connections across disciplines, and reflect on the implications of human actions on the environment. This reflective process is crucial for nurturing informed, responsible global citizens.

Beyond cognitive development, Eco-Edu also plays a critical role in shaping student behavior and character. Integrating environmental topics into ELT creates a ripple effect that extends far beyond the classroom. As Vukelić and Rončević (2021) affirm, students who are consistently exposed to eco-conscious messages tend to adopt more sustainable habits, such as reducing waste, conserving energy, and participating in tree-planting initiatives. These

behavioral changes signal a shift from passive awareness to active commitment, which is essential for addressing global ecological crises.

Moreover, Eco-Edu supports the development of socio-emotional competencies. Students who engage in environmental projects often exhibit greater empathy, responsibility, and cooperation. For instance, Noviana et al. (2023) observed that students involved in local environmental programs or disaster-relief efforts demonstrated heightened social awareness and a willingness to contribute to the well-being of others. These experiences foster a sense of purpose and agency, helping students see themselves as part of a larger community with the power to effect positive change.

In integrating Eco-Edu into ELT, teachers also serve as role models. When educators show commitment to sustainability, whether by minimizing paper use, participating in green campaigns, or using eco-friendly materials in class, they reinforce the importance of these values through everyday actions. This modeling behavior can be as influential as formal instruction in shaping students' attitudes and behaviors.

The integration of ecological education into English Language Teaching is not merely a trend but a necessity in today's globalized and environmentally challenged world. It aligns with national educational goals, enhances student engagement, fosters critical and creative thinking, and nurtures responsible behavior. Through meaningful, real-world content and hands-on learning, students not only improve their language skills but also become empowered agents of change. For educators and institutions seeking to create more impactful, future-oriented learning environments, Eco-Edu offers a rich and promising pathway—one that bridges language learning with ecological literacy and global citizenship.

CONCLUSION

Integrating Ecology Education (Eco-Edu) into English Language Teaching (ELT) is a highly effective approach to foster environmental awareness, critical thinking, and sustainable behavior among students. The findings of this study suggest that Eco-Edu not only enriches English language learning by making it more relevant to students' lives, but also plays a significant role in shaping environmentally conscious individuals. By connecting environmental themes with language skills such as reading, writing, speaking, and listening, students gain a deeper understanding of ecological issues and their practical implications.

Integrating Eco-Edu into ELT facilitates students' active participation through hands-on activities such as project-based assignments, group discussions, and multimedia resources. This method helps students develop critical thinking skills by engaging them in real-world environmental issues and encouraging them to find creative and sustainable solutions. In addition, Eco-Edu has a significant impact on students' behavior, promoting sustainable actions such as waste management, tree planting, and maintaining a clean environment, which contribute to a more sustainable future.

To ensure the successful integration of Eco-Edu, schools must provide institutional support, including environmentally friendly policies and ecology-based curricula, to create a conducive learning environment. Teachers also play a vital role in delivering Eco-Edu content through engaging and relevant materials, and fostering a climate of environmental responsibility. By embracing Eco-Edu, English language teaching can become a powerful tool for nurturing a generation of environmentally conscious and responsible citizens, equipped with the knowledge, skills, and attitudes needed to address global environmental challenges.

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