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Green-Themed Project-Based Learning in ELT: Improving EFL Students' Environmental Sensitivity and Communicative Skills

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ABSTRACT

The proposed research aims to explore the effectiveness of Green-Themed Project-Based Learning (PBL) in enhancing EFL learners' environmental awareness and communicative capabilities. A quasi-experimental pretest-posttest control group was used, which included 20 university students in a control group with conventional instruction and an experimental group with a green-themed PBL intervention that occurred over four instruction sessions. Two instruments were used in the research: a Likert-type scale of environmental sensitivity and a communicative skills assessment rubric that assesses fluency, vocabulary use, coherence, and interaction. Independent-samples t-tests were also applied to compare gain scores between the groups and to estimate the effect size, which was computed using Cohen's d. As it was found, students in the experimental group exhibited much higher improvement in both environmental sensitivity ($t = -6.52$, $p < 0.001$, $d = 1.98$) and communicative skills ($t = -5.61$, $p < 0.001$, $d = 1.71$) in comparison with the students in the control group. These findings indicate that Green-Themed PBL is an effective tool that enhances students' ecological awareness and, at the same time, boosts their communicative competence. The study found that implementing environmentally oriented PBL in ELT teaching can offer valuable educational opportunities that help achieve language competency and ecological literacy. The results point to the pedagogical importance of sustainability-oriented learning in EFL classrooms and the tendency to introduce wider application of contextually specific project-based strategies in higher education.

Keywords: Project-Based Learning, green education, environmental sensitivity, communicative skills, ELT

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INTRODUCTION

The degradation of the environment and issues related to climate have become a more acute issue in the world, which requires immediate consideration at the level of all fields, including education. New educational trends have highlighted the need to incorporate sustainability and environmental responsibility into curricula, including English Language Teaching (ELT). Researchers claim that the role of language education in the development of linguistic competence is not the only factor; it is also a context in which values, attitudes, and awareness regarding global citizenship and environmental responsibility may be formed (Wu, 2020; Zembylas, 2023). Such pedagogical change has led ELT practitioners to seek ways to improve students' communicative competence and ensure ecological literacy at the same time.

National efforts to increase sustainability, environmental protection, and character building in Indonesia have facilitated the adoption of environmental education in higher education (Yu et al., 2024). This initiative is significant in areas like Tomohon, which are defined by the diversity of their ecological environments and the close interaction of local communities with them. Despite these changes, EFL classroom practices in Indonesia remain characterised by traditional teacher-centred approaches (Huda and Lubis, 2019; Kaspul et al., 2020). These methods tend to place heavy emphasis on grammar, vocabulary, and exams, with little or no opportunity to explore critical thinking, creativity, and social-environmental interactions.

Project-Based Learning (PBL) has emerged as a promising pedagogical paradigm that promotes student-centred, real-world learning, group work, and communicative skills (Guevara, n.d.; Martinez, 2022; Williamson, 2023). Green-Themed PBL offers meaningful opportunities for students to address real ecological problems and apply English in meaningful and interactive ways, in case PBL is integrated with environmental themes. It has been previously demonstrated that PBL promotes communicative competence and learner motivation by enabling active engagement and real-life assignments (Arshad et al., 2020; Robina-Ramirez and Medina-Merodio, 2019). Moreover, environmental projects have been identified as having a positive impact on learners' environmental attitudes and awareness (Genc, 2015).

Nevertheless, the use of Green-Themed PBL in ELT in Indonesian higher education is relatively unknown. The current literature is more inclined toward the role of PBL in enhancing speaking skills, writing ability, or collaborative learning (Li et al., 2024), and only a few studies have considered the possibility of PBL to increase the environmental sensitivity of students, emotional awareness of a person, and care about environmental problems (Bergman, 2016). Sensitivity to the environment is essential for promoting pro-environmental behaviour, yet it is frequently ignored in language learning. Furthermore, the prevailing practice in previous research is to treat linguistic development and environmental awareness as separate areas, which creates a gap in knowledge about the possibility of applying pedagogical interventions to both simultaneously. This disconnect is especially relevant in environments such as Tomohon, where environmental issues are closely intertwined with students' day-to-day experiences.

To fill this research gap, the current study examines the effectiveness of Green-Themed Project-Based Learning in improving environmental awareness and communicative competence among EFL students (Ghosheh Wahbeh et al., 2021; Vega Munar, 2022). In particular, the article investigates the hypothesis that Green-Themed PBL can achieve substantial gains in environmental awareness compared with traditional education, and the effect of the approach on student fluency, vocabulary use, coherence, and interaction (Dong et al., 2018; Xiao, 2022; Zhao, 2023). This research aims to provide information on how sustainability-related instructional practices could be meaningfully incorporated in ELT classrooms.

METHOD

This research design was a quasi-experimental study and a pretest-aftertest control group design. This design was chosen since it allows comparing outcomes of learning in two groups that receive various instructional interventions and maintains ecological validity in a real classroom environment. The experimental group received Green-Themed Project-Based Learning (PBL), while the control group received traditional teaching through teacher-centred activities and textbook-based exercises. Both teams used the same pretests and posttests to evaluate shifts in environmental sensitivity and communicative skills (Pangemanan et al., 2023).

The sample comprised 20 undergraduate EFL students enrolled in an English education program in Tomohon, Indonesia. They were grouped in two equal sets: 10 students in the control group and 10 in the experimental group. The participants were all aged 18-22, and their English proficiency was similar, as indicated by their institutional academic performance. Convenience sampling was used because participants were selected from preexisting intact classes available to the researcher.

The intervention consisted of four instructional sessions. The Green-Themed PBL treatment required students to engage in environment-based activities, such as creating eco-literacy posters, running short environmental campaigns, and presenting solutions to environmental problems in the Tomohon area. The students were involved in planning their projects, collecting information, and presenting their work in English. Conversely, the control group was given conventional teaching based on the explanation of grammar, vocabulary exercises, and individual exercises presented in textbooks, but lacking project-based activities (Halici Page & Mede, 2018; Lalira et al., 2024).

Two primary instruments were used to collect the data. The former was an Environmental Sensitivity Scale that used a 5-point Likert scale to assess students' awareness, emotional

involvement, and concern about environmental issues. The second tool was a Communicative Skills Assessment Rubric that evaluated students' performance in speaking and presentation tasks in including fluency, vocabulary use, coherence, accuracy, and interaction (Lalira et al., 2022). The two instruments were based on validated sources and checked by two ELT experts to ascertain content validity.

Data were collected in two phases (Shabani & Panahi, 2020). A pre-test was carried out before the instructional treatment in order to obtain baseline scores. The same instruments were used at the end of the four-session instructional period as a posttest to assess the improvement and compare learning gains in the experimental and control groups. To obtain the means and standard deviations, the quantitative data were analysed using descriptive statistics. Independent-samples t-tests were used to determine whether the difference in gain scores between the groups was significant. The gain scores were computed by subtracting the pre-test scores from the post-test scores of the members. The size of the treatment effect was estimated using Cohen's d to classify it as slight, moderate, or significant, according to the conventional interpretive guidelines (Gignac and Szodorai, 2016; Ialongo, 2016; Kallogjeri and Piccirillo, 2023).

This study was conducted in terms of ethical considerations. The purpose of the study was explained to the participants, who were assured that their participation was voluntary. Participants were informed of the importance of confidentiality as no student data were anonymised and were used only in the research.

FINDING AND DISCUSSION

1. Environmental Sensitivity Results

This section presents the results of the quantitative analysis related to students' environmental sensitivity. Table 1 displays the descriptive statistics for both the control and experimental groups. Although both groups started with identical pretest means, the experimental group demonstrated a substantially greater improvement in the posttest.

Table 1. Descriptive Statistics for Environmental Sensitivity

Group	Pretest Mean (SD)	Posttest Mean (SD)	Gain Mean
Control (n = 10)	3.01 (0.41)	3.10 (0.42)	0.09
Experimental (n = 10)	3.01 (0.41)	3.48 (0.36)	0.47

The independent-samples t-test revealed a significant difference in gain scores between the two groups, $t(18) = -6.52$, $p < 0.001$. The effect size (Cohen's $d = 1.98$) indicates a significant effect, confirming that students in the Green-Themed PBL group experienced substantially greater gains in environmental sensitivity than those in the control group.

2. Communicative Skills Results

The results for communicative skills also demonstrated greater improvement in the experimental group. Table 2 presents the descriptive statistics for both groups. Although the groups had similar pretest scores, the experimental group achieved a notably higher posttest mean, resulting in a far greater gain score.

Table 2. Descriptive Statistics for Communicative Skills

Group	Pretest Mean (SD)	Posttest Mean (SD)	Gain Mean
Control (n = 10)	65.02 (5.76)	67.43 (5.53)	2.41
Experimental (n = 10)	65.02 (5.76)	75.32 (4.74)	10.30

An independent-samples t-test showed a significant difference in gain scores between the two groups, $t(18) = -5.61$, $p < 0.001$. The effect size (Cohen's $d = 1.71$) indicates an enormous effect. This suggests that Green-Themed PBL effectively enhanced students' communicative performance, including their fluency, vocabulary use, coherence, accuracy, and interactional ability.

3. Summary of Findings

The quantitative results confirm that Green-Themed Project-Based Learning produced significantly greater improvements in both environmental sensitivity and communicative skills than conventional instruction. Both t-tests yielded highly significant values, and the corresponding effect sizes were huge. These results show that integrating environmental themes into project-based activities benefits both ecological awareness and linguistic performance.

Discussion

1. Environmental Sensitivity Interpretation.

The significant increase in students' environmental sensitivity in the experimental group provides evidence of the effectiveness of incorporating environmental themes in PBL activities. The students were taught about ecological issues in their local context, both emotionally and cognitively, which aligns with Chawla (2024), who stated that emotional engagement is an essential step in developing environmental sensitivity and pro-environmental attitudes. The low response rate in the control group is yet another indication that conventional teaching may not give learners enough time to engage meaningfully with their environment.

2. Communicative Skills Findings Interpretation.

The high communicative proficiency of the experimental group is one more argument in favour of Green-Themed PBL as a tool for ELT teaching. Due to the exposure to real communicative activities, such as discussions, presentations, and explanations related to the campaign, learners could train and enhance their fluency, coherence, vocabulary, and interactive skills. These results confirm existing studies that emphasise the beneficial influence of PBL on communication and verbal performance (Garib, 2023).

3. ELT Pedagogical Implications.

Based on the findings, the Green-Themed PBL could help to improve ELT practices by offering meaningful, context-based, and student-centred learning experiences. The given teaching strategy enables students to develop environmental consciousness and language proficiency, thereby promoting greater involvement and conceptualisation. The results align with the research of Chang et al. (2022), who claim that PBL promotes autonomy, creativity, and critical thinking.

4. The Indonesian Relevance of context in higher education.

Environmental concerns involving waste management, biodiversity conservation, and community environmental initiatives are directly applicable to life in Tomohon. When these issues are introduced in classroom activities, their motivation and responsibility increase. This confirms the assumption of Li et al. (2022) that green learning can expand students' horizons and create valuable learning opportunities. The results are also in conformity with the national higher education objectives in Indonesia, focused on sustainability and character building.

5. Future Research Limitations and Directions.

Despite these encouraging results, some weaknesses must be mentioned. The sample size was small, and the intervention lasted no more than four sessions. Future research can utilise larger samples and longer implementation durations to refine the findings and investigate additional variables. Despite these weaknesses, the effect sizes found in this study are large and illustrate the high potential of Green-Themed PBL to improve learners' performance (Anggraeni et al., 2023; Lavi and Marti, 2023).

CONCLUSIONS

The current study examined how Green-Themed Project-Based Learning can enhance environmental sensitivity and communicative skills among EFL students in Tomohon, Indonesia. The results showed that students who underwent the Green-Themed PBL intervention exhibited significant improvement in both variables compared with those taught using conventional methods.

This indicates that incorporating environmental themes and using project-based activities can create significant learning experiences that simultaneously build ecological awareness and language acquisition.

The significant rise in environmental sensitivity suggests that the students became more emotionally involved and more conscious of the ecological concerns relevant to the local setting. The fact that PBL offers a real-life experience of communicative skills also shows that the approach helps students share ideas, communicate with their peers, and deliver project outcomes in English. These results emphasise the educational importance of integrating ELT and sustainability education and provide helpful information for teachers interested in adopting more engaging, context-specific teaching methods.

The findings indicate that Green-Themed PBL can be used as an adequate substitute for standard teacher-centred teaching. It encourages higher-order thinking processes and learner independence and enhances classroom interaction by applying environmental issues in the real world to English learning experiences. This model follows the national educational objectives of focusing on character building, environmental responsibility, and communicative skills in Indonesian higher education.

Although the study's results are positive, there are some limitations. The sample size was also relatively small, and the intervention was not administered over a long period. It is also recommended that further studies include more participants, that the intervention be longer, and that other variables (critical thinking, collaboration, and long-term changes in behaviour) be considered. Future research can also involve combining digital tools, multimodal projects, and community-based environmental initiatives to amplify the impact of Green-Themed PBL further.

This research supports the prospects of sustainability-oriented solutions in ELT. With the use of the Green-Themed PBL, it is possible to cultivate not only communicative competence but also ecological awareness in educators and equip them to become an ecologically responsible and globally minded people.

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