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Implementation of Environmental Education Courses: Analysis of RPS and Student Learning Experiences

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Abstract. This study aims to describe the implementation of Environmental Education (EE) courses for second-semester students in the Biology Education Study Program by examining the relationship between the Semester Learning Plan (SLP), lecturers teaching practices, and students learning experiences. This study employs a qualitative descriptive approach with data collection techniques including document analysis, interviews with lecturers, and student interviews. The analysis reveals that the EE curriculum structure incorporates learning outcomes based on ecological literacy and is implemented through active methods such as recycling projects and field trips to environmental institutions. Students demonstrated positive responses and began to exhibit changes in their attitudes toward the environment, though these changes were not yet fully consistent. The study also highlighted the importance of integrating sustainability values across courses and strengthening affective evaluation. In conclusion, the implementation of PLH contributes to the development of students ecological awareness and is relevant for expansion in biology teacher education.

Keywords: Environmental Education; Ecological Literacy; Learning Experiences; Biology Students

INTRODUCTION

The ecological crisis currently plaguing the world is the result of the accumulation of human thinking and behavior that is not environmentally friendly. Global warming, water and air pollution, deforestation, loss of biodiversity, and the energy crisis are clear indicators of the increasingly alarming environmental degradation, driven by materialistic views and economic incentives that have led to the global ecological crisis (Hadi et al., 2024). This phenomenon not only impacts natural ecosystems but also threatens the quality of life and sustainability of future generations (Wisman & Santoso, 2024).

In addressing these global challenges, education plays a strategic role as a transformative tool to instill ecological awareness, foster responsible attitudes, and encourage concrete actions to preserve the environment. Environmental problems arise due to humanity's increasing greed in exploiting nature. Humans no longer consider the impacts of the exploitation they engage in (Wisman & Santoso, 2024). Environmental Education serves as a crucial instrument for cultivating a generation with ecological competencies, both cognitively, affectively, and psychomotorically..

At the higher education level, particularly in Biology Education programs, strengthening EEE is highly relevant. Students are not only prepared as scientists or academics but also as future educators who will become agents of change in society. Creating a community that cares and is willing to work toward environmental solutions, transforming individual behavior into environmentally friendly behavior (Munawaroh et al., 2022). Additionally, students' awareness and understanding of environmental sustainability are still at an early stage (Rabbianty, 2022). Therefore, integrating PLH into the curriculum from the outset of studies is expected to establish a strong foundation of ecological values and knowledge, enabling students to develop environmental literacy (Hanafi et al., 2021).

However, the implementation of Environmental Education in higher education still faces various challenges, ranging from limitations in participatory learning methodologies to a lack of contextualization of materials with local realities. Therefore, a critical review of the urgency, role, and strategies for strengthening Environmental Education in higher education, particularly in biology education programs, is needed.

MATERIALS AND METHODS

Research Method

This article uses a qualitative descriptive study approach that aims to describe the importance of Environmental Education for second-semester students in the Biology Education Study Program at Pattimura University. This approach was chosen to analyze in-depth understanding of the implementation of EE courses in the field.

Data Source

The data sources in this study consist of:

1. Semester Learning Plan (RPS) documents for the Environmental Education course in the second semester of the Biology Education Study Program;
2. Semi-structured interviews with lecturers teaching the Environmental Education course and several students who have taken the course;
3. Supporting literature from scientific journals, academic books, and national policies relevant to environmental education and education for sustainability.

Data Collection and Analysis Techniques

The selection of data collection techniques in this study was based on the need to gain a comprehensive understanding of the implementation of Environmental Education courses, not only from the formal curriculum perspective but also from the experiences and perceptions of educators. Therefore, a triangulation approach was used, combining documentary and oral data. This strategy aims to enhance the credibility and richness of the information obtained in the qualitative descriptive study.

The techniques used include:

1. Document study, conducted on the Semester Learning Plan to identify learning outcomes, core material, learning strategies, and forms of evaluation. Document analysis allows researchers to understand the formal structure of PLH learning as designed by educational institutions.
2. Semi-structured interviews, conducted with Environmental Education lecturers and students (Milla & Febriola, 2022). This technique was chosen because it is flexible and allows for more in-depth data collection related to the context, experiences, and subjects' views on the implementation of learning and its relevance in shaping ecological awareness.

The data obtained were analyzed qualitatively using a thematic analysis approach, namely by identifying and grouping data based on the main themes that emerged from the documents and interview results. To ensure that interview guidelines are always updated to elicit the necessary information for future interviews or group discussions, thematic analysis can be conducted using transcripts of interview or group discussion results (Najmah et al., 2023). This analysis enables researchers to interpret the meaning behind educational practices and evaluate the alignment between curriculum planning and its implementation in the field.

RESULTS AND DISCUSSION

Description of the Semester Learning Plan (RPS)

The Environmental Education course taught in the second semester of the Biology Education Study Program is one of the basic courses designed to equip students with conceptual understanding, critical thinking, and practical skills in addressing environmental issues in schools and communities. According to the Semester Learning Plan document, this course carries a weight of 3 credit hours and is conducted over one semester.

The Course Learning Outcomes (CPMK) include:

1. Students master the basic concepts and principles of biology related to environmental education in biology learning;
2. Students have the ability to make decisions and/or generate creative ideas for addressing problems in the application of biological science, both in schools and in the community, related to environmental education;
3. Students are able to explore and utilize the potential of local natural resources and combine them with advances in science and technology (IPTEKS) for the purposes of environmental education research.

The course material covers:

a. Basic concepts of environmental education
b. Resources and their management
c. Environmental issues
d. Environmental pollution

e. Waste management
f. Environmental health
g. Environmental ethics
h. Environmental management strategies

These topics are organized thematically to provide a theoretical foundation and a space for reflection for students to understand the holistic relationship between humans and the environment.

In its implementation, learning is delivered through various methods, including interactive lectures, group discussions, case studies, project assignments, and direct observation of non-governmental organizations (NGOs) working in the field of environmental protection. This observation provides students with real-world experience in understanding the social and institutional dynamics of environmental management (Joesyiana, 2018). These approaches are designed to strengthen the connection between course material and real-world applications, as well as encourage students to develop critical thinking, collaborative, and problem-solving skills.

Learning evaluation is conducted in a combined manner with an emphasis on the aspects of knowledge, skills, and attitudes of students. The forms of evaluation include individual assignments, group presentations, midterm and final exams, as well as two main project-based activities, namely:

1. Presentation of a waste recycling project, in which students design and present innovations in waste management based on the reduce-reuse-recycle (3R) principle;
2. Presentation of observation reports to NGOs, to examine actual environmental management practices and the relevance of environmental education in society.

This assessment model not only measures students' conceptual understanding but also develops their critical thinking, creativity, and social and ecological awareness as future educators. All aspects of student learning outcomes, including cognitive, psychomotor, and affective, are typically evaluated through a combination of various types of assessment (Magdalena et al., 2020). The diversity of evaluation forms also allows students to demonstrate their learning outcomes in a more holistic and contextual manner (Abdul & Hasan, 2025).

This RPS reflects the study program's commitment to developing eco-pedagogical competencies in students, who are expected to become biology educators capable of facilitating critical, creative, and transformative environmental learning. The effectiveness of the implementation of this RPS will be further assessed through interviews with lecturers and students, which will be discussed in the following section.

Perspective of Lecturers

The interview was conducted with one of the lecturers teaching the Environmental Education course in the second semester of the Biology Education Study Program, who was subsequently identified by the initials “IA.” The interview took place in person on May 20, 2025, to gain an understanding of the implementation of the course from the instructor's perspective.

In terms of learning objectives, the interviewee stated that the course is designed to cultivate awareness, knowledge, and skills necessary for students to actively participate in environmental conservation. He emphasized the importance of providing a foundational understanding of the reciprocal relationship between humans and the environment, as well as fostering a sense of responsibility toward environmental conservation from the outset of the course.

In terms of learning materials, the lecturer stated that the main topics include: basic concepts of Environmental Education, natural resources and their management, environmental issues, pollution, waste management, environmental health, environmental ethics, and environmental management strategies. This material is delivered through various active learning methods, including lectures, group discussions, case studies, field practice, and task-based projects (Sipayung & Kurniawan, 2025). One form of connection between the material and local issues is a paper assignment that encourages students to raise topics related to the environment around the campus as material for discussion.

In terms of learning evaluation, in addition to midterm exams, final assessments are conducted through presentations on waste recycling projects and the compilation of field observation reports. This evaluation model aims to encourage the application of concepts in real-world contexts and to develop students' critical and creative thinking skills.

While student enthusiasm is generally good, instructors also acknowledge challenges related to differences in learning styles and motivation among students. Some students are very active in participating in various practical activities, while others show minimal response. This is closely related to independent learning, which can directly influence learning motivation; learning styles can also influence learning motivation; and learning outcomes are also influenced by learning motivation (Khotimah & Wahjudi, 2021). Lecturers note that students'

awareness of the importance of protecting the environment is often still abstract and has not been fully translated into daily actions.

Regarding the contribution of the course to environmental awareness, the interviewee stated that changes in students' attitudes have not yet been observed concretely, but it is believed that "some changes are definitely occurring, at the very least, littering has become something they consider." Habituation is not just about taking action; it can instill feelings and attitudes of care for the environment (Nugroho, 2022). This indicates that although the process of internalizing values proceeds slowly, Environmental Education still plays a role as the initial catalyst for students' ecological awareness.

As a reflection, the interviewee hopes that environmental conservation values are not only taught in a single course but integrated into the entire curriculum of the program. In their view, cross-course integration will be more effective in fostering students' ecological understanding and attitudes in a sustainable manner.

Student Voices: Learning Experiences and Reflections

To enrich this descriptive study, interviews were conducted with five second-semester students of the Biology Education Study Program who were taking the Environmental Education course. The interviews were conducted in person on June 19, 2025, and were aimed at exploring the students' perceptions, learning experiences, and the impact of learning on their attitudes.

In general, all respondents stated that the Environmental Education course is very important for fostering environmental awareness and concern among future biology teachers. They described the course as one that "broadens horizons," "connects with real-world issues," and "integrates biological science with daily life." Some students even referred to Environmental Education as a "core course" that should be given greater prominence in the curriculum.

In terms of learning experiences, most students mentioned field observation activities and waste recycling projects as the most memorable experiences. Thus, field observation learning methods can enhance knowledge and understanding in line with students' experiences (Nikmah, 2023). Visits to waste banks or environmental NGOs were considered highly relevant and brought classroom material to life. One student stated that the recycling project taught them that waste management is not just about disposal but also about creatively reusing it to reduce pollution. Respondents also evaluated the teaching methods applied by instructors, which combine theory, discussion, and field practice, as "effective," "balanced," and "encouraging critical and creative thinking." Some students mentioned that this method facilitates group work, communication, and problem-solving skills.

In terms of personal reflection, all students admitted to experiencing a change in attitude after taking this course. These changes included small actions such as bringing their own water bottles, sorting waste, conserving energy, and developing a critical awareness of their role as young people in preserving the environment. One student even said that he had changed from being "indifferent to caring."

Additionally, students revealed that they recognized the complexity of environmental issues, which cannot be fully understood through textbooks alone. Through discussions and observations, they learned that solutions to environmental problems often arise from collaboration between communities, academics, and practitioners. As an alternative, this learning approach could enhance student learning outcomes (Sahala et al., 2024).

As feedback, students suggested that this course should more frequently involve local case studies, expand collaboration with NGOs or environmental communities, and develop concrete actions such as community service or environmental campaigns. They believe that by more intensively involving the real world, environmental education will become more meaningful and impactful.

Synthesis of Findings and Pedagogical Implications

The results of the analysis of the RPS, interviews with lecturers and students show that the Environmental Education course in the second semester of the Biology Education Study Program has been designed and implemented with an emphasis on the principles of sustainability-based learning and real-world experience. The curriculum, systematically structured through learning outcomes that encompass cognitive, affective, and psychomotor aspects, provides a foundation for efforts to develop students' ecological literacy.

Data from interviews with faculty members indicate that the pedagogical approach used aligns with eco-pedagogy practices, which involve not only imparting concepts but also encouraging action, empathy, and reflection on environmental issues. This is evident from the integration of active learning methods such as discussions, waste recycling projects, and field observations. In line with research conducted by (Puspita et al., 2022) creative abilities can be enhanced through a project-based learning model focused on recycling.

The lecturer's view is reinforced by interviews with students, which show that Environmental Education learning has had a positive impact on their awareness and attitudes. Students not only understand Environmental

Education concepts theoretically, but also begin to apply sustainability principles in their daily lives, such as sorting waste, reducing the use of single-use plastics, and being more sensitive to local environmental issues. However, there are some disparities that need to be addressed. The lecturer acknowledges that changes in students' attitudes are not always immediately apparent, and some students still show low levels of engagement. This indicates that the process of internalizing sustainability values cannot be achieved overnight but requires a consistent, reflective, and interdisciplinary approach.

From the students' perspective, most desire more direct involvement with local issues and practical field activities. This opens opportunities for developing more contextual and collaborative PLH learning models, such as through sustainable partnerships with NGOs, schools, or local communities, as suggested by.

The pedagogical implications of these findings suggest that the success of Environmental Education courses depends not only on the material taught but also on how it is taught, the extent to which students are actively involved, and how environmental values are internalized across the curriculum. Therefore, in addition to maintaining the active learning strategies that have been effective, educational institutions need to promote the integration of environmental education values into other courses, foster an ecological academic culture, and develop a more comprehensive and contextual affective assessment system.

Thus, the Environmental Education course can serve as a strategic entry point for producing biology teacher graduates who are not only academically competent but also possess critical awareness and a strong commitment to environmental conservation.

CONCLUSION

The Environmental Education course in the second semester of the Biology Education Study Program has been systematically designed and implemented through a curriculum that reflects the integration of ecological knowledge, skills, and attitudes. Findings from interviews with lecturers and students indicate that active learning methods, such as waste recycling projects and field observations, are effective in building conceptual understanding and triggering students' awareness and reflection on environmental issues.

Although the affective impact has not yet been fully realized, there are positive indications that students are beginning to internalize sustainability values in their daily lives. Student engagement in contextual and collaborative learning is key to strengthening transformative environmental education. Therefore, strengthening the integration of environmental values across courses and developing a holistic and reflective evaluation system must continue to be pursued as part of the commitment to sustainability-oriented biology education.

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REFERENCES

Abdul, S., & Hasan, H. (2025). Bentuk dan Teknik Evaluasi Hasil Belajar. *JURNAL MUDABBIR*, *5*, 1–13. https://doi.org/10.56832/mudabbir.v5i1.656

Hadi, S., Sjah, T., & Sarjan, M. (2024). *Peran Manusia Dalam Mempertahankan Ketersediaan Sumber Daya Alam Melalui Etika Lingkungan*. *4*(2), 143–149. https://doi.org/10.58218/lambda.v4i2.907

Hanafi, Y., Aprilia, N., Nurusman, A. A., Purwanto, A., Nadiroh, N., & Budi, S. (2021). Analisis Kebutuhan Pengembangan Instrumen Literasi Lingkungan Untuk Mahasiswa Pendidikan Biologi FKIP Universitas Ahmad Dahlan. *Jurnal Eksakta Pendidikan (Jep)*, *5*(2), 174–180. https://doi.org/10.24036/jep/vol5-iss2/604

Joesyiana, K. (2018). PENERAPAN METODE PEMBELAJARAN OBSERVASI LAPANGAN (OUTDOR STUDY) PADA MATA KULIAH MANAJEMEN OPERASIONAL (Survey pada Mahasiswa Jurusan Manajemen Semester III Sekolah Tinggi Ilmu Ekonomi Persada Bunda). *PEKA*, *6*(2), 90–103.

Khotimah, N. V. K., & Wahjudi, E. (2021). Pengaruh Kemandirian dan Gaya Belajar Terhadap Hasil Belajar Dengan Variabel Mediasi Motivasi Belajar. *Jurnal Pendidikan Akuntansi (JPAK)*, *9*(2), 280–291. https://doi.org/10.26740/jpak.v9n2.p280-291

Magdalena, I., Afianti, N. A., & Yanti, A. A. (2020). Penilaian Hasil Belajar Siswa Dengan Kurikulum 2013 Di Sd Islam Asysyakirin. *Jurnal Pendidikan Dan Dakwah*, *2*(3), 466–476.

Matias, D. M. Kone, M. Karim, P G. San Jose, D. Mariano, B. J. Ortiz, A. M. Dubey, P. K. Garcia, G. *The need for transnational networks and transdisciplinary education for sustainable development in UNESCO Biosphere Reserves in the Global South.* Current Opinion in Environmental Sustainability. https://doi.org/10.1016/j.cosust.2025.101553

Milla, H., & Febriola, D. (2022). Analisis Pengambilan Keputusan Memilih Masuk Program Studi Pendidikan Ekonomi di Fakultas Keguruan dan Ilmu Pendidikan Universitas Muhammadiyah Bengkulu. *Jurnal Multidisiplin Dehasen (MUDE)*, *1*(3), 149–158. https://doi.org/10.37676/mude.v1i3.2493

Munawaroh, R. Z., Abroto, A., Nugraheni, A. S., & Carlian, Y. (2022). Penanaman Nilai Karakter Peduli Lingkungan melalui Mata Kuliah Pendidikan Lingkungan Hidup pada Mahasiswa PGMI. *Instructional Development Journal*, *5*(1), 33. https://doi.org/10.24014/idj.v5i1.19102

Najmah, Adelliani, N., Afny, C. S., & Rahmah, A. z. (2023). *Analisis Tematik pada penelitian kualitatif*. penerbit salemba.

Nikmah, K. (2023). Penerapan Metode Pembelajaran Observasi Lapangan pada Mata Kuliah Studi Arsip untuk Meningkatkan Kemampuan Berpikir Kritis Mahasiswa. *ASANKA : Journal of Social Science and Education*, *4*(1), 26–33. https://doi.org/10.21154/asanka.v4i1.5912

Nugroho, M. A. (2022). Konsep Pendidikan Lingkungan Hidup Sebagai Upaya Penanaman Kesadaran Lingkungan Pada Kelas Iv Min 1 Jombang. *Ibtidaiyyah: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, *1*(2), 16–31. https://doi.org/10.18860/ijpgmi.v1i2.1691

Puspita, A. M., Utomo, E., & Purwanto, A. (2022). Model Pembelajaran Berbasis Proyek Mata Pelajaran IPA Kelas III Dalam Meningkatkan Kemampuan Berfikir Kreatif Siswa. *Tunas: Jurnal Pendidikan Guru Sekolah Dasar*, *7*(2), 55–65. https://doi.org/10.33084/tunas.v7i2.3194

Rabbianty, E. N. (2022). Pemahaman mahasiswa terhadap literasi lingkungan (ekoliterasi): Potensi dan tantangan menuju kampus ramah lingkungan. *10*(2), 163 - 176. https://doi.org/10.36052/andragogi.v10i2.302

Sahala, R., Mauraji, J., Tomahir, A. D., Adam, A., & Silawane, N. (2024). Dampak Metode Pengajaran Terhadap Pembelajaran Mahasiswa Institut Agama Islam Negeri (IAIN) Ternate. *Jurnal Ilmiah Wahana Pendidikan*, *10*(13), 1–23. https://doi.org/https://doi.org/10.5281/zenodo.13149454

Sarabi, S. McPhearson, T. Tunçer, B. Frantzeskaki, N. (2025). *eXtended Reality for promoting people- nature relationships in cities : a scoping review.* urban sustainability.

Sipayung, M. S., & Kurniawan, D. (2025). Analisis Metode Pembelajaran Aktif dan Literasi Digital terhadap Motivasi dan Hasil Belajar Mahasiswa dengan SEM-PLS. *Journal Scientific of Mandalika*, *6*(5). https://doi.org/10.36312/10.36312/vol6iss5pp1401-1421

Wisman, Y., & Santoso, J. (2024). Pendidikan Lingkungan Hidup Untuk Meningkatkan Ecoliteracy Siswa. *Jurnal Ilmiah Kanderang Tingang*, *15*(1), 29–39. https://doi.org/10.37304/jikt.v15i1.302