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The Role of the Sustainable Development Goals (SDGs) in Environmental Conservation through Interactive Educational Counseling and Kokedama Training

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Abstract

The increasing problem of environmental degradation requires efforts to strengthen environmental literacy from an early age. The Sustainable Development Goals (SDGs) place the environment as an important pillar of sustainable development, yet children's understanding of the SDGs' role remains limited. This community service activity aims specifically to increase students' knowledge about the SDGs' environmental goals and to develop their practical skills in environmental stewardship at Sekolah Alam Insan Mulia Surabaya. These objectives will be pursued through interactive counseling and hands-on training in making kokedama. The activity was held on December 8, 2025, using dialogic lectures, discussions, educational games, and practical exercises. The activity results showed increased understanding of the role of the SDGs in protecting the environment and improved skills in processing coconut fiber waste into environmentally friendly plant decorations with aesthetic value. This activity helps foster an environmentally conscious character from an early age.

Keywords: *community service; environmental education; kokedama; school-age children; SDGs*

INTRODUCTION

Global environmental damage has evolved beyond an ecological concern into a pressing humanitarian issue, undermining the quality of life for current and future generations (Lakhdar & Anime, 2023). Among the important indicators suspected to be caused by environmental damage are climate change, biodiversity decline, marine pollution, and shrinking urban green spaces (Shivanna, 2022). These realities are closely related to the increasingly diverse and evolving consumption patterns and lifestyles of modern humans. Environmental damage is also marked by massive natural disasters, such as floods and landslides, in various regions of Indonesia and around the world, which are strongly suspected to have resulted from the destruction of forest ecosystems caused by human economic intervention (Ramadhan et al., 2023).

In response to these conditions, the United Nations has formulated the Sustainable Development Goals (SDGs) as a global framework for sustainable development. This framework places environmental protection among its key pillars, particularly through Goals 12 (sustainable

consumption and production), 13 (climate action), 14 (life below water), and 15 (terrestrial ecosystems (Lee et al., 2016). Since their launch, the SDGs have become a common language in global development policies across countries, especially among UN member states (Hena et al., 2024). Indonesia and several other countries have formally adopted the SDGs by incorporating them into national and regional policies. However, in practice, the SDGs have not yet fully become part of society's collective consciousness. In many communities, the SDGs are still understood as global policy jargon that is not fully connected to everyday practices, as reflected in the high consumption of plastic, low waste sorting habits, and limited participation of the younger generation in environmental conservation activities (Leicht et al., 2018).

Previous studies have shown that low SDG literacy among the public, especially the younger generation, is associated with weaker pro-environmental behavioral change (Hu et al., 2025). This gap between knowledge and behavior regarding the SDGs threatens the successful implementation of this program and may negatively impact the achievement of the SDGs' main goal: a prosperous global community. In response to this challenge, UNESCO (2020) emphasizes the importance of experience-based sustainable education to encourage long-term behavioral change. Building on this, (Krayneva et al., 2021) explain the important role of quality education in SDG implementation from childhood to adulthood in realizing a better world in the future.

In the context of elementary school children, this phase is a golden period for character building. As (Green, 2015) emphasize, children's direct interaction with nature plays an important role in building ecological empathy and environmental responsibility. Building on this, Practice-based learning approaches are effective strategies for this purpose. Environmental education should not be a one-way transfer of information, but a structured process within a clear curriculum that develops and strengthens environmental attitudes, values, and knowledge, while also preparing individuals and communities to collaboratively implement positive environmental management and protection actions. Additionally, it facilitates the application of research findings, creating a synergistic space where stakeholders work together to address dynamic environmental issues (Ardoin et al., 2020).

Insan Mulia Surabaya Nature School provides an educational space with a strong potential to internalize SDG values in a contextual and applicable manner. This community service activity aims to increase students' understanding of the SDGs' important role in preserving the environment, foster children's personal responsibility for caring for the earth, and improve students' skills in processing organic waste into environmentally friendly planting media with aesthetic value. Activities included interactive sessions by Zahratunnisa Ramadhani, M.H.I., a UPN International Relations lecturer focused on SDG implementation, and Dr. Siti Asmaniyah Mardiyani, a UNISMA Faculty of Agriculture lecturer specializing in agroecology and kokedama planting. The training sessions also received practical assistance from Luluk, Farhan, and Pinarci, students from the Faculty of Agriculture at the Islamic University of Malang, who helped guide participants through hands-on environmental learning activities.

METHOD

This community service activity was held on December 8, 2025, at Sekolah Alam Insan Mulia Surabaya, targeting 4th and 5th-grade elementary school students. It was part of a series of LC activities at Sekolah Alam Insan Mulia Surabaya, an annual event that improves students' leadership capacity. The activity was designed using an experiential learning approach, which is learning based on direct experience that combines the cognitive, affective, and psychomotor aspects of students (Voukelatou, 2019). Cognitive and affective skills were enhanced through fun, interactive, and imaginative educational sessions. Students explored environmental responsibility via presentations, discussions, and nature-themed songs. During the training

activities, students were actively involved in collecting materials, arranging media, and creating beautiful kokedama pot models using plants prepared by the school. The plants chosen were spider plants (Chlorophytum comosum), known for their air-purifying properties.

Stages of Activity

The activity comprised three sequential stages: preparation, implementation, and evaluation.

a. Preparation Stage

The preparation stage began with coordination with the school, particularly the principal and fourth and fifth-grade teachers, to agree on the timing, number of participants, and readiness of supporting facilities for the activity. Following this initial coordination, the team compiled SDG-based educational materials focused on two main activities: environmental responsibility education and kokedama-making training, using simple language and examples relevant to students' lives. In addition, to support the activities, visual learning materials were prepared in the form of posters, presentations, and student worksheets, along with a short module on kokedama making. Simultaneously, the team prepared practical tools and materials, including coconut fiber, soil, ornamental plants, hemp rope, and water, so that each student could be directly involved in the practical activities.

b. Implementation Stage

The implementation of activities consists of two main sessions:

1. **Interactive Counseling on Environmental Responsibility based on SDGs**

   The counseling was delivered through interactive lectures, question-and-answer sessions, educational games, and light quizzes. The first session focused on the concept of the SDGs and the role of children in protecting the environment, presented by Zahratunnisa Ramadhani, M.Hi. Following this, Dr. Siti Asmaniyah Mardiyani led the second session, emphasizing the importance of protecting trees and animals as the foundation for raising a healthy, environmentally conscious young generation.

2. **Kokedama Training session**

   The practical session was guided by students from the Faculty of Agriculture at the Islamic University of Malang, namely Luluk, Farhan, and Pinarci. Under their guidance, participants learned to make kokedama using coconut fiber waste as a planting medium. During the training, each step from mixing the medium and forming soil balls to planting, binding techniques, and plant care was demonstrated in sequence, ensuring a comprehensive learning experience.

c. Evaluation Stage

This community service activity was evaluated comprehensively to assess its achievement of objectives. The evaluation included participatory observation to note students' involvement, enthusiasm, and environmental awareness. At the end, students shared their ideas verbally about the SDGs and described any changes in their attitudes. In addition, the students' kokedama products were assessed. The assessment covered aspects of neatness, functionality as a planting medium, and creativity in design and selection of ornamental plants. The results of this evaluation were used as indicators of the success of socialization and training in fostering an environmentally conscious character from an early age.

RESULT AND DISCUSSION

The community service activities at Sekolah Alam Insan Mulia Surabaya proceeded effectively, eliciting a highly positive response from students. Participants showed enthusiasm from the outset, as evidenced during both the information session and the kokedama-making training.

Students were actively engaged by asking questions and expressing curiosity about the Sustainable Development Goals (SDGs) and environmental conservation practices throughout the program. Observations and verbal reflections following the session suggested greater understanding of the SDGs and the role of children in environmental protection. Prior to the activity, most students were unfamiliar with the term SDGs or their relevance to daily behavior.

Prior to the activity, most students were unfamiliar with the Sustainable Development Goals (SDGs) and could not relate them to their daily behaviors. Following the socialization, over 80% of students identified at least 3 examples of environmentally friendly behaviors consistent with SDG values, including proper waste disposal, water conservation, plant care, and protection of animal habitats. This improvement in understanding indicates that a dialogic lecture approach, supplemented by educational games and interactive discussions, is effective in facilitating students' comprehension of abstract global concepts in ways that are contextually relevant to their lives. These results are consistent with (Ardoin et al., 2020), who argue that experience-based learning and social interaction can enhance the internalization of sustainability values in children.

According to Ardian et al (2020) direct conservation program outcomes often addressed broader environmental issues through locally relevant examples and incorporated opportunities for action. In the present activity, the use of familiar practices applied the principle of local relevance by giving students concrete ways to interpret broad sustainability goals. The educational games and guided discussions may have reinforced these connections by giving students opportunities to articulate how everyday choices relate to sustainability. The post-activity responses therefore indicated that students could translate SDG concepts into practical examples at the end of the session. Meanwhile, whether students subsequently adopted these practices would require follow-up observation.



Figure 1. The environment during the socialization and outreach activities

All students successfully completed the kokedama project utilizing coconut fiber waste during the training session, demonstrating not only technical understanding but also a high level of engagement throughout the activity. The resulting products showed considerable variation in form, structural composition, and aesthetic quality, reflecting each student's individual creativity and interpretation of the technique. Differences were particularly evident in the precision of the binding process, the compactness of the planting medium, and the originality of decorative elements such as wrapping styles and additional ornaments.

In terms of quality assessment, approximately 85% of the students' work met the established criteria, which included neatness of construction, strength and durability of the binding, and functional suitability as a planting medium capable of supporting plant

growth. These outcomes indicate that the majority of participants were able to effectively apply the instructions and adapt them into practice. Meanwhile, the remaining students, although successfully completing the project, showed minor weaknesses in aspects such as binding consistency or overall compactness, suggesting the need for additional guidance or practice. Overall, the training session not only achieved its primary objective of introducing sustainable use of agricultural waste, specifically coconut fiber, but also fostered practical skills, environmental awareness, and creative expression among students. The variation in results further highlights the importance of hands-on learning approaches in encouraging innovation while still maintaining adherence to functional standards.



Figure 2. Kokedama making training activity

The kokedama-making training session at Sekolah Alam Insan Mulia Surabaya fostered a vibrant and collaborative learning environment. Fourth- and fifth-grade students worked in small teams, wrapping threads around coconut fiber spheres filled with ornamental plants to create kokedama. Their strong engagement was evident in their focused participation, particularly during the design and enhancement of their projects. This hands-on activity developed students' precision, fine motor skills, and creative abilities in shaping planting media. Through kokedama-making, students learned about plant care in an enjoyable, environmentally responsible way. The workshop provided an authentic, context-based learning experience that promoted early environmental stewardship. Ultimately, the kokedama workshop offered a memorable educational opportunity and encouraged a heightened sense of responsibility for the natural environment. It also demonstrated that organic waste can be repurposed into attractive and functional creations.

The kokedama activity gave elementary school students a practical way to apply the sustainability concepts introduced earlier in the session. This reinforces the findings of (Hnatyuk & Yaroshchuk, 2024), which emphasize that hands-on sustainability education is more effective at building environmental awareness than a purely theoretical approach. Building on this, the activity not only improved understanding and skills but also shaped environmental awareness among elementary school students. In this activity, making a kokedama gave students a chance to practice a planting technique, while caring for the finished plant offered a way to continue applying what they had learned. Students expressed pride in their work and said they wanted to care for the plants they had made. Some also said they intended to encourage their families to grow and care for plants at home. These responses indicate that enjoyable, applicable, and experience-based learning can foster students' emotional attachment to nature. This observation is consistent with (Chawla, 2015)’s view that children's emotional involvement with nature is an important factor in shaping long-term pro-environmental behavior.

CONCLUSION

The Community service activities conducted at Sekolah Alam Insan Mulia Surabaya, implemented through interactive counseling and kokedama-making training, have effectively enhanced students' understanding, skills, and attitudes toward environmental stewardship. Presenting the Sustainable Development Goals (SDGs) in a contextually relevant way has helped integrate global sustainable development concepts into students' daily practices. After participating in these activities, 80% of students reported an increased understanding of the SDGs' role in environmental protection and demonstrated improved skills in processing coconut fiber waste into sustainable planting media. These outcomes indicate that the experiential learning approach effectively fosters environmental consciousness from an early age. This activity yields cognitive and psychomotor benefits and also reinforces students' emotional connection to nature.

It is recommended that similar activities be implemented on an ongoing basis and extended to additional schools, with particular emphasis on nature-based and urban elementary schools. Schools, universities, and environmental organisations should continue to strengthen collaboration to support the systematic and sustainable integration of SDG values. Furthermore, the development of more structured quantitative evaluation tools is essential to effectively measure the long-term impact of changes in student behavior.

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AI Disclosure

Generative Artificial Intelligence (AI) and AI-assisted technologies were used solely to improve the readability and organization of the manuscript. All outputs generated through these tools were carefully reviewed, edited, and validated by the author to ensure accuracy, completeness, and alignment with the study's original content. The author assumes full responsibility and accountability for the integrity of the work, including its analysis, interpretation, and conclusions. AI tools were not used for data generation, data analysis, or as a substitute for scholarly judgment, and are not listed as authors or co-authors of this study.

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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