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The Saung Interaktif Model: A Participatory Approach to Improving Household Waste Management Literacy in Rural Indonesia

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ABSTRACT

This research examines the effectiveness of the Saung Interaktif model as a community-based environmental education strategy aimed at strengthening household waste management literacy in rural Indonesia. The initiative applied a one-group pretest–posttest quasi-experimental design involving 35 female PKK cadres from Nyalindung District, Sukabumi Regency. The intervention incorporated experiential learning components such as eco-enzyme production, composting methods, preparation of liquid organic fertilizer, environmental health education, and introductory digital marketing training. Data were gathered through a 20-item structured knowledge assessment administered before and after the program, and were analyzed using descriptive statistics along with paired comparative analysis. The results revealed a 20% increase in average knowledge scores after the intervention, reflecting meaningful gains in environmental literacy and practical waste management skills. These findings indicate that participatory, hands-on environmental education can significantly strengthen community capacity and encourage sustainable household waste practices. Nevertheless, the lack of a control group and the relatively brief monitoring period restrict the ability to draw strong causal conclusions. Overall, the Saung Interaktif model presents a scalable approach for integrating environmental education, public health promotion, and economic empowerment within rural sustainability programs.

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INTRODUCTION

Household waste generation in Indonesia continues to increase, creating significant environmental management challenges, particularly in rural regions where formal waste services remain limited (Kementerian Lingkungan Hidup dan Kehutanan Republik Indonesia [KLHK], 2023). In many rural communities, waste is often disposed of through open burning or unmanaged dumping practices, which contribute to environmental degradation and public health concerns (Suryani & Pratama, 2021). Such conditions highlight the urgent need for community-based waste management strategies that emphasize behavioral change alongside technical solutions (Suryani & Pratama, 2021). Community empowerment plays a central role in promoting sustainable environmental practices, as participatory engagement strengthens collective responsibility and local ownership (Cyrilla & Sumantri, 2022). Educational interventions that involve active participation have been shown to improve environmental literacy and encourage long-term behavioral transformation (Mulyani & Nurmila, 2024). Environmental literacy itself encompasses knowledge, attitudes, and practical competencies necessary to support sustainable environmental decision-making at the household and community levels (Mulyani & Nurmila, 2024). Community-based waste processing approaches, such as composting and maggot cultivation, have demonstrated effectiveness in reducing organic waste while simultaneously generating economic value (Mabruroh et al., 2022). The utilization of maggot-based processing systems not only decreases waste volume but also contributes to sustainable resource recovery and alternative feed production (Rusdi et al., 2024). Furthermore, integrating locally available agricultural resources into sustainable production systems enhances circular economy practices at the community level (Octavia & Mu'min, 2023). Sustainable waste management initiatives are closely aligned with global development priorities, particularly the Sustainable Development Goals (SDGs), which emphasize responsible consumption, environmental protection, and community well-being (United Nations, 2015). Specifically, SDG 12 highlights the importance of waste reduction, recycling, and sustainable resource use, while SDG 3 underscores the connection between environmental sanitation and public health outcomes (United Nations, 2015). Despite increasing implementation of community-based waste programs, many initiatives remain fragmented and lack structured evaluation of literacy outcomes and behavioral impacts (Suryani & Pratama, 2021). Empirical evidence suggests that participatory educational models are more effective when they integrate environmental awareness, technical skill development, and economic empowerment within a unified framework (Mulyani & Nurmila, 2024; Cyrilla & Sumantri, 2022). Therefore, strengthening integrative and community-driven environmental education models is essential to achieving sustainable waste management and broader development objectives (United Nations, 2015).

METHOD

Research Design

This study adopted a one-group pretest–posttest quasi-experimental design to evaluate changes in participants' environmental literacy before and after the intervention. This design enabled the researchers to measure knowledge improvement resulting from the implementation of the Saung Interaktif program.

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Participants

The study involved 35 female PKK cadres from Nyalindung District, aged between 28 and 55 years. Participants had diverse educational backgrounds, ranging from elementary school to undergraduate level. They were recruited through coordination with local community leaders to ensure representation and active community engagement.

Intervention Procedure

The program was implemented using a participatory, community-based approach aimed at fostering active engagement, shared responsibility, and sustainable impact. This strategy aligns with community empowerment principles that emphasize collective participation and local ownership in development initiatives (Cyrilla & Sumantri, 2022). The intervention was carried out through four interconnected stages:

- Socialization and Stakeholder Coordination

The initial phase focused on establishing shared understanding and commitment among stakeholders. Coordination meetings were conducted with representatives of local government, PKK leaders, and partner institutions to clarify program objectives and identify prevailing environmental challenges. A preliminary needs assessment was undertaken to determine existing knowledge gaps and barriers related to household waste management. Designing programs based on identified community needs has been recognized as a key factor in enhancing the effectiveness of environmental interventions (Suryani & Pratama, 2021).

- Capacity Building through Training and Hands-On Practice

Structured training sessions were conducted with all 35 participants to strengthen both theoretical knowledge and practical skills in sustainable waste management. The training modules covered:

- ✓ Eco-enzyme production from household organic waste
- ✓ Composting techniques using simple, locally available materials
- ✓ Preparation of liquid organic fertilizer (LOF)
- ✓ Environmental health and sanitation education
- ✓ Basic digital marketing strategies for value-added products

Community-based organic waste processing, including composting and maggot-based methods, has been widely acknowledged as an effective approach for reducing waste volume while generating economic benefits (Mabruroh et al., 2022; Rusdi et al., 2024). The instructional strategy combined lectures, interactive discussions, demonstrations, and intensive hands-on practice. Experiential learning approaches are considered more effective than conventional lecture-based methods in promoting skill retention and practical competence (Cyrilla & Sumantri, 2022).

- Evaluation of Learning Outcomes

To assess changes in environmental literacy, structured pre-test and post-test instruments were administered. The assessment focused on participants' knowledge of waste segregation, organic waste processing, and environmental health concepts. Integrating quantitative testing with observational evaluation provides a more comprehensive assessment of community-based educational programs (Mulyani & Nurmila, 2024).

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- Monitoring, Mentoring, and Follow-Up

Post-training mentoring activities were conducted to reinforce skill application and ensure program sustainability. Continuous guidance and community reinforcement are essential to maintaining long-term behavioral change in environmental management initiatives (Suryani & Pratama, 2021). Monitoring efforts focused on encouraging consistent household-level adoption of waste processing practices and strengthening community commitment to sustainable environmental behavior.

RESULTS AND DISCUSSION

The program resulted in measurable improvements in participants' knowledge and skills. These findings are consistent with previous studies showing that participatory environmental education significantly enhances community literacy (Mulyani & Nurmila, 2024). Based on the graph of the pre-test and post-test results across five learning topics, there is a clear increase in scores for all topics after participants completed the learning activities. This suggests that the materials provided were effective in improving participants' understanding of the subjects studied. In general, the pre-test scores reflect the participants' initial level of knowledge before receiving the instructional materials, whereas the post-test scores indicate their level of understanding after the learning process had been completed.

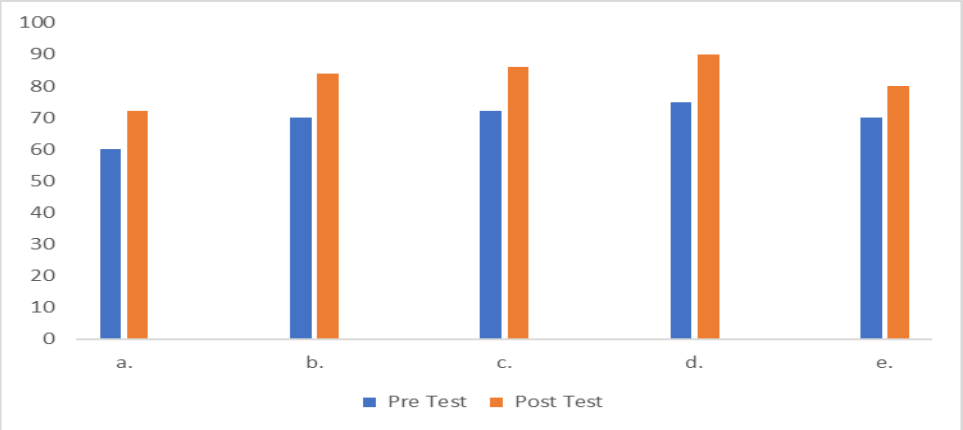

FIGURE 1. Production of eco-enzyme from household organic waste (a), Composting techniques using simple and locally available materials (b), Preparation of liquid organic fertilizer (c), Environmental health education (d), Basic digital marketing strategies (e).

All participants successfully practiced eco-enzyme production and composting independently during the training sessions. Observational monitoring indicated improved understanding of waste segregation and increased motivation to implement household-level waste processing. The improvement suggests that participatory and experiential learning methods effectively enhance both conceptual understanding and technical competence. The total number of participants was 35 (thirty-five) individuals. Successfully practiced eco-enzyme and compost production during training sessions. The experiential learning approach proved more effective than lecture-based instruction alone, consistent with findings by Cyrilla and Sumantri (2022), which emphasize the importance of practical engagement in community empowerment programs. The Saung Interaktif functioned as a community-based environmental laboratory. Community-based innovation spaces have been shown to strengthen local capacity and collective problem-solving (Suryani & Pratama, 2021). Participants demonstrated increased motivation to apply waste management practices at home, indicating early-stage behavioral change. The integration of environmental and health education further reinforced the relationship between sanitation and family well-being. Proper waste handling contributes to improved environmental health and disease

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prevention (KLHK, 2023). The digital marketing component introduced the economic dimension of waste processing. Transforming organic waste into value-added products aligns with sustainable resource utilization principles (United Nations, 2015) and supports community economic resilience. Overall, these findings confirm that the Saung Interaktif model represents an effective, integrative framework for community-based environmental education. By combining participatory learning, practical skill development, health awareness, and economic empowerment, the model shows strong potential for replication in similar rural contexts. The findings demonstrate that the Saung Interaktif model effectively improves environmental literacy and practical waste management skills among rural community members. The significant improvement in knowledge scores supports Experiential Learning Theory, which posits that active engagement enhances retention and behavioral adoption. Hands-on practice enabled participants to internalize waste processing techniques more effectively than lecture-based instruction alone.The integration of environmental health education strengthened awareness of the relationship between sanitation and family well-being. This multidimensional approach aligns with:

- SDG 12 (Responsible Consumption and Production) by promoting waste reduction and recycling.
- SDG 3 (Good Health and Well-being) by improving sanitation awareness and environmental hygiene.

Furthermore, the inclusion of digital marketing introduced economic empowerment dimensions, encouraging sustainable livelihood opportunities from processed organic waste products. The Saung Interaktif model functions as a community-based environmental learning laboratory that integrates education, skill development, and social empowerment. This integrative structure distinguishes it from conventional waste awareness programs.

FIGURE 2. Documentation of Community Service Activities.

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CONCLUSION

The Saung Interaktif model effectively enhances environmental literacy and practical waste management competencies in rural communities. The program resulted in a measurable 20% improvement in knowledge scores and enabled participants to independently implement eco-enzyme production and composting techniques. By integrating experiential environmental education, public health awareness, and economic empowerment, the model offers a comprehensive framework for sustainable community-based waste management. Policymakers and local governments are encouraged to integrate similar participatory environmental learning centers into village-level sustainability programs. Future studies should employ longitudinal and controlled research designs to evaluate long-term behavioral transformation and policy scalability.

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