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EDUCATION ON PLASTIC WASTE MANAGEMENT WITH THE 3R (REDUCE, REUSE, AND RECYCLE)

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ABSTRACT

The issue of plastic waste has become an urgent environmental problem in Indonesia, including on the campus of STIKes Karsa Husada Garut. Plastic waste, which is difficult to decompose, can pollute the environment and pose health risks. To address this problem, a waste management education program based on the 3R principle (Reduce, Reuse, Recycle) was implemented with the aim of increasing knowledge, shaping environmentally friendly behavior, and encouraging creative waste management practices. The implementation method includes preparation, education through interactive lectures and workshops, field practice with the creation of separate waste bins, the making of ecobricks, and creative products from plastic waste, as well as monitoring and evaluation of the program's success. The results of the activities show an increase in participants' knowledge of 35-40%, behavioral changes such as reduced use of plastic bags and disposable bottles, and the development of creative products from plastic waste. Program evaluation confirms the effectiveness of participatory methods and hands-on practices in building awareness and internalizing sustainability values. This program also has implications for the formation of an environmentally friendly culture on campus, which can serve as a model for other educational institutions. Thus, 3R-based education not only reduces the negative impact of plastic waste but also fosters environmentally conscious students who are able to apply sustainability principles in their daily lives.

Keywords: *Education, Plastic, Waste, 3R (Reduce, Reuse, Recycle)*

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1. INTRODUCTION

The issue of waste, particularly plastic waste, is one of the most pressing environmental issues in Indonesia (Marlinda et al., 2025). Plastic waste is difficult to break down naturally, so it can pollute the soil, water, and air, and disrupt the balance of the ecosystem (Antara, 2025). According to data from the Ministry of Environment and Forestry, Indonesia ranks second as the largest producer of plastic waste in the world. This situation calls for systematic and sustainable efforts in plastic waste management to minimize its negative impact on the environment and public health (Andhika Lungguh Perceka et al., 2025).

The campus environment, including STIKes Karsa Husada Garut, is one of the places with high potential for generating plastic waste, both from academic activities and the daily activities of students and teaching staff (Basir et al., 2025). Disposable drinking bottles, plastic bags, and food packaging are the main sources of waste in the campus environment. If not managed properly, the accumulation of this waste not only affects the cleanliness and aesthetics of the campus, but also has the potential to pose health risks, such as an increase in the population of disease vectors and water pollution in the surrounding environment (Danendra, 2025).

Effective plastic waste management requires an approach that is not only physical but also educational (Jamil et al., 2025). One strategy that can be applied is the 3R principle, namely Reduce, Reuse, and Recycle. This principle provides practical guidance for individuals and groups to reduce plastic waste production, reuse materials that are still usable, and process waste into new useful products. By implementing the 3Rs, campuses can not only reduce the amount of waste disposed of in the environment, but also increase the awareness of students and the academic community of the importance of sustainable environmental management (Majida et al., 2023).

Education on 3R-based waste management at STIKes Karsa Husada Garut is highly relevant because it is in line with the institution's mission to produce health workers who are not only professionally competent but also care about the environment and public health. Students who are accustomed to environmentally friendly behavior from an early age are expected to spread these good practices to the wider community, especially in the context of preventing diseases related to pollution and sanitation. In addition, effective waste management on campus can serve as an example of sustainable environmental practices for other educational institutions in the Garut region (Muhammad et al., 2024).

Several studies and field experiences show that systematic education on waste management can foster awareness and positive behavioral change in individuals (Perceka, 2018). This educational program can be carried out through various methods, such as counseling, workshops, recycling training, and 3R-based waste management competitions. Students can be directly involved in waste management activities, such as making ecobricks, composting organic waste, or processing plastic waste into other creative materials. These activities not only provide practical knowledge but also build awareness and responsibility towards the environment (Safriani et al., 2022).

With this background, the development of a 3R-based plastic waste management education program at STIKes Karsa Husada Garut has become a strategic necessity. This program aims not only to create a clean and healthy campus but also to shape students' character to be environmentally conscious and capable of applying sustainability principles in their daily lives. Additionally, this program is expected to serve as a model for waste management in other educational institutions in Garut Regency, thereby extending its positive impact to a broader community (Wangge et al., 2023a).

METHODS

The implementation of the 3R-based plastic waste management education program at STIKes Karsa Husada Garut is designed systematically so that the target audience, namely students, lecturers, and educational staff, can understand and apply the 3R principles in their daily lives. The methods used to carry out the activities include the preparation stage, education implementation, waste management practices, and evaluation (Wangge et al., 2023b).

a. Preparation Stage
   - Identification of needs and initial conditions: The implementation team will conduct a preliminary survey on campus to determine the amount and types of plastic waste produced, as well as the behavior of the academic community regarding waste management (Setia, 2025).

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- Preparation of educational materials: Educational materials include an introduction to plastic waste, its impact on the environment and health, and 3R-based management strategies (Reduce, Reuse, Recycle). The materials are compiled in the form of presentations, leaflets, and practical guides.
- Coordination with related parties: The team will coordinate with the campus administration, environmental student activity units, and supervising lecturers to ensure that the activities run effectively.

b. Education Implementation Stage

- Counseling and seminars: Conducted through face-to-face or online sessions to provide an understanding of the importance of plastic waste management and the 3R principle.
- Interactive workshops: Students and the academic community are involved in practical activities such as making ecobricks, recycling plastic into crafts, or composting organic waste mixed with biodegradable plastic.
- Waste reduction simulations: Participants are invited to design strategies to reduce plastic use on campus, such as bringing their own water bottles or eco-friendly shopping bags.

c. Field Practice Stage

- Creation of separate trash bins: Providing separate trash bins (plastic, organic, and residual) at various points on campus as a means of practicing 3R waste management.
- Active student involvement: Students are given responsibility for managing plastic waste, recycling, and producing monthly reports on the activities carried out.
- Collaboration with environmental student activity units: Students can work together with student activity units or environmental groups to develop creative products from plastic waste.

d. Monitoring and Evaluation Stage

- Activity monitoring: The implementation team will conduct periodic monitoring of the implementation of waste management education and practices on campus.
- Evaluation of results: Assessments are carried out through questionnaires, interviews, and observations to determine the level of knowledge, attitudes, and behaviors of students towards plastic waste management.
- Reporting and recommendations: Evaluation results will be used to compile activity reports and recommendations for program sustainability, including efforts to expand 3R practices throughout the campus environment.

e. Program Sustainability Stage

- Create 3R-based environmentally friendly campus guidelines.
- Schedule regular activities such as plastic recycling workshops every semester.
- Form a campus environmental team or community to maintain consistency in the implementation of 3R.

This implementation method is designed to be participatory, practical, and sustainable, so that it not only increases the academic community's knowledge about plastic waste management, but also fosters an environmentally friendly culture that can be applied in everyday life.

RESULT AND DISCUSSION

1. Results

The implementation of the 3R-based plastic waste management education program at STIKes Karsa Husada Garut has been carried out for a certain period of time, involving students, lecturers, and educational staff. The results obtained can be categorized into three main aspects, namely knowledge, behavior, and waste management practices, which were then analyzed further as follows (Abbas et al., 2025):

a. Increased Knowledge about Plastic Waste Management and 3R

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After participating in educational activities such as lectures, seminars, and interactive workshops, the majority of participants showed an increase in their understanding of plastic waste and the 3R principles. The results of questionnaires administered before and after the activities showed an average increase in knowledge scores of 35-40%. Participants gained a better understanding of the negative impact of plastic waste on the environment and health, as well as concrete steps to reduce, reuse, and recycle plastic waste.

b. Behavioral Changes among the Academic Community

In addition to increased knowledge, there were indications of behavioral changes among the academic community regarding waste management. Students began to bring their own drinking bottles, reduce the use of disposable plastic bags, and get used to separating waste according to category (plastic, organic, residue). Field observations showed a 20% decrease in the volume of plastic waste in the main campus area compared to before the program.

c. Waste Management Practices and Creative Products

During the activity, students successfully made a number of ecobricks from plastic waste collected on campus. The ecobricks produced can be used as miniature building materials or educational media. In addition, plastic waste that is still usable is processed into handicrafts, such as pencil holders or key chains. This activity not only reduces the amount of waste disposed of, but also fosters students' creativity in reusing plastic waste.

d. Program Evaluation and Implications

An overall evaluation of the program shows that the success of this activity was influenced by several key factors, namely participatory methods, active student involvement, support from the campus, and the provision of adequate facilities and infrastructure (separate trash bins, educational materials, and recycling tools). The implications of these results are the need for the development of a sustainable 3R education program, for example through routine activities, integration into the curriculum, and the formation of an environmentally conscious community on campus.

2. Discussion

This increase in knowledge demonstrates the effectiveness of participatory and hands-on educational methods. The material presented in visual form, practical exercises, and group discussions enabled participants to understand the 3R concept in a more practical way, not just theoretically (Yusnita et al., 2022). This is in line with the principles of environmental education, which emphasize experiential learning as the most effective way to build awareness and competence.

This behavioral change shows that education accompanied by real practice can encourage the internalization of sustainability values. Through the active involvement of students in making ecobricks, recycling plastic into creative products, and managing separate waste bins, they experience a learning process through real actions, making it easier to form new habits. This phenomenon supports environmental behavior theory, which states that direct interaction with environmentally friendly activities increases individual commitment to behavioral change (Setiawati et al., 2025).

These results show that practice-based education programs can create added value from plastic waste, while building awareness of the importance of sustainable waste management. The creative products produced can also be used as a means of promotion and education for the campus community and the public, expanding the positive impact of the program. In other words, this activity is not only educational but also innovative, combining environmental, educational, and creative aspects (Suliartini et al., 2022).

With the sustainability of the program, it is hoped that the 3R-based waste management culture will become ingrained in the academic community and serve as an example for other educational institutions in Garut. This program can also encourage students to apply the 3R principles in their daily lives and in the wider community, thereby making a real contribution to reducing plastic waste in the surrounding environment (Astriani et al., 2020).

CONCLUSSION

The 3R-based plastic waste management education program at STIKes Karsa Husada Garut has successfully increased knowledge, changed behavior, and encouraged creative and sustainable waste management practices. This success demonstrates the importance of an educational approach that combines theory and practical experience in shaping environmental awareness and behavior.

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