Bubungan Tinggi: Jurnal Pengabdian Masyarakat
http://ppjp.ulm.ac.id/journals/index.php/btj/index
e-ISSN: 2722-3043 p-ISSN: 2722-2934
Vol 7 No 1 2025
DOI: https://doi.org/10.20527/btjpm.v7i1.11904

Waste Selection Education in an Effort to Solve Waste Problems

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Article Info

Article history:
Received: February 13, 2024
Accepted: September 9, 2024
Published: January 19, 2025

Keywords:
Education
Elemtary school
Proper
Manajement

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Abstract

Proper management of waste is crucial due to its potential to harm ecosystems and contribute to pollution. We should collectively initiate environmental stewardship by doing minor measures to safeguard it. Consequently, students at SDN 1 Sumberdem, Wonosari-Malang, are anticipated to acquire knowledge and engage in socializing regarding rubbish sorting through their participation in community service activities. The objective of this activity is to heighten students' awareness and motivate them to exhibit more attentiveness towards their immediate environment. It is crucial for children to comprehend the categorization of garbage, encompassing organic, inorganic, and B3 waste, alongside hazardous and toxic substances, and acquire the skills to manage them appropriately. Hence, it is imperative to socialize youth in order to deter archaic tendencies, such as discarding waste outdoors. Furthermore, it is imperative to provide them with instruction on the proper techniques for sorting, selecting, and categorizing waste, as well as on how to effectively operate a waste bank to make revenue. Engaging in games, presentations, and other interactive activities facilitates the process of socialization. There is an expectation that minor habits will propagate throughout the entire family and neighborhood, thus aiding in the mitigation of the environmental waste issue.

To cite this article: Arifah, R. N., Amirudin, A., Salsabila, G., Arliyah, R. S., Abdillah, M. R., Marza, L., & Idris, A. K. M. (2025). Waste selection education in an effort to solve waste problems. *Bubungan Tinggi: Jurnal Pengabdian Masyarakat, 7* (1), 162-168.

INTRODUCTION

Waste management is one of the major challenges faced by communities in Indonesia, based on data from the Ministry of Environment and Forestry in 2023, Surabaya is one of the cities in East Java that has a total waste (tons) of 1,600,000 due to lack of public awareness in separating organic and inorganic waste, limited waste management facilities. In line with the data above, Malang city (TPA Supit Urang) is approaching maximum capacity and requires the development of better sanitary landfill facilities.

This is in line with SIPSN data that the amount of waste in Indonesia reached 17,441,415.28 tons/year . This is due to the lack of public awareness of waste management (Miliyanti et al., 2022), lack of support from the village government and unavailability of facilities and infrastructure for waste management (Walimah et al., 2024). Therefore, education on waste management is very often important to be improved in the community.

The volume of waste generated is increasing day by day, one of which is caused by the increase in population. If this waste problem is left without preventive action and good management, it can damage the environment (Ratnasari et al., 2019). Therefore, methods

are needed to convert unused materials into products that can be used or provide economic value. Many recommendations are offered to streamline waste management procedures, including the 3R principles (reduce, reuse, recycle) (Febriyanti et al., 2023).

Waste is a term used to describe unwanted material left behind after a process ends that is considered unusable due to human activity (Marlinda et al., 2023). Waste is divided into 3 types, namely organic, inorganic, and hazardous and toxic waste (Hamsiah & Nuradji, 2023). Each type of waste has different characteristics and processing methods. Organic waste comes from living things, inorganic waste comes from non-living materials that cannot be decomposed by nature, and B3 waste contains hazardous or toxic compounds (Diartika & Sueb, 2021; Ratnasari et al., 2019).

To solve this problem, education about waste management must start early at the conscious school level (Agustriyana et al., 2022). Teaching students about waste segregation and the importance of protecting the environment can form positive habits that will be carried into adulthood. Education in elementary schools has a role in instilling the values of environmental awareness, because early childhood is the right time to instill good and sustainable habits (Gusti et al., 2022).

Although there are many studies on waste management, there are limited studies that specifically evaluate the effectiveness of a holistic educational approach in an elementary school setting. Dewi and Kusnita (2023) explained that the problem of waste and its management in Wongaya Gede Village is still very minimal, this is due to the lack of supporting facilities and low student awareness of the environment. Herlambang and Martono (2018) also explained that waste is a problem for big and small cities, it is closely related to sanitation and environmental health as well as aesthetic issues.

However, due to the many different types of waste, students need to be educated on how to dispose of waste properly. This education aims to help students understand the importance of waste segregation, recognize the types of waste, and understand the negative impact of waste on the environment and health if not managed properly (Fitri, 2023; Ratnasari et al., 2019).

Based on the above background, the following understanding is needed for students on the importance of disposing of waste according to its category: 1) Increase the understanding of SDN 1 Sumberdem students on the importance of waste segregation based on its type; 2) Instill positive habits in waste management from an early age; 3) Reduce the amount of waste in the school environment through proper waste segregation practices; and 4) Help students understand the negative impact of waste on the environment and health.

METHODS

This socialization activity was given to students of SDN 1 Sumberdem. The target in the waste selection education socialization activity was aimed at students in grades 3, 4 and 5. This activity was held to raise students' awareness about the importance of being a student to start taking action to prevent the accumulation of waste around them, because so far SDN 1 Sumberdem has not implemented a separate waste disposal system between organic and inorganic waste.

The table below presents the schedule of activities conducted during the suty or educational program. The activities include distributing quetionnaires to students', direct observation of student behaviour, and presenting material on waste sorting education. Additionally, there are direct practice sessions by students', ice breaking activities and games, as well as review of the material through a question-and-answer session with students'.

The questionnaires were given to students before the material was given to find out students' initial understanding of waste and its processing. Furthermore, direct observation

of student behavior was carried out, namely monitoring students' habits in disposing of waste during the activity. This observation aims to assess how aware students are of waste segregation in the school environment. The presentation of materials including the types of waste (organic, inorganic and B3), the impact of waste on the environment, and the importance of waste segregation delivered verbally. Pramita et al. (2024) and accompanied by visual demonstrations (Diana et al., 2018). The direct practice by students, namely giving students the opportunity to sort waste according to its type and be actively involved in the waste sorting process. The ice breaking and games aimed at maintaining student enthusiasm and focus during the activity. The material review and question and answer, this is the final activity to find out each student's understanding of the material that has been delivered.

RESULTS AND DISCUSSION

This study revealed that the socialization of waste selection conducted by UIN Maulana Malik Ibrahim Malang students at SDN 1 Sumberdem successfully involved 100 students in grades 3, 4, and 5. This socialization is very important to provide sufficient information about waste selection and the dangers of landfilling for the environment.

The activity began with a material presentation by one of the KKM UIN Malang students, which discussed the definition of waste, the difference between organic and inorganic waste, and the negative impacts caused by waste. The presentation of the material is done in a language that is easily understood by students, ensuring their understanding. The Figure 1 shows that presentation activities are used as a tool to provide literacy for students'.

Figure 1 Material presentation

After the presentation of the material (Amin et al., 2024), a demonstration of sorting organic and inorganic waste was conducted by the speaker to all students. Next, the speaker appointed several students to practice sorting waste correctly. The results showed that each student was able to sort waste according to its category, indicating a successful understanding of the concepts taught.

The next activity involved ice breaking by several students. Ice breaking aims to create a more relaxed atmosphere, so that the presentation of the next material can be done more pleasantly. This step is important in creating a positive and supportive learning environment.

Ice breaking is used as a medium to help create a relaxed and comfortable atmosphere, increase active involvement and participation, build familiarity and cooperation (Amelia et al., 2023). In this socialization activity of waste selection at SDN 1 Sumberdem, ice breaking was carried out before and in the middle of the educational session (see Figure 2). In this case, specifically the benefits obtained are: 1) creating student enthusiasm, students become more excited and enthusiastic about participating in activities after doing ice breaking. This can be seen from their activeness in the question and answer session and the

practice of sorting waste; 2) facilitating the delivery of material, with a more relaxed and comfortable atmosphere, the speaker is easier to convey the material to students and reciprocally, students are easier to understand the information conveyed; 3) increasing interaction between students and presenters, ice breaking can create reciprocity and can directly increase familiarity, positive interactions and make educational sessions more interactive and fun.

Figure 2 Ice breaking followed by all participants

The next stage was a question and answer session between the speaker and the students (see Figure 3). The question and answer activity was designed to measure the extent of students' understanding of the sorting of organic and inorganic waste. The results showed that students were able to answer the speaker's questions correctly, in accordance with the information that had been conveyed previously. This indicates a good level of understanding of the concept of waste segregation.

Figure 3 Students answering questions from the speaker

Overall, this socialization activity succeeded in bringing a positive impact on students' understanding of waste selection. The clear presentation of materials, hands-on practice, ice breaking, and question and answer together created a fun and effective learning experience. This study makes an important contribution in the effort to increase public awareness and participation, especially students, in responsible waste management.

CONCLUSION

Based on the results of the Waste Sorting Socialization program at SDN 1 Sumberdem, this activity succeeded in increasing students' understanding of the importance of waste management. Clear presentation of material, accompanied by hands-on practice, ice breaking, and question and answer sessions, created a fun and effective learning atmosphere. This increased understanding is an important first step in building students' awareness and participation in responsible waste management, which is expected to have a wider impact on the surrounding community.

However, this study has a shortcoming, namely the absence of a follow-up evaluation of changes in students' habits in sorting waste after the program ends. Therefore, future

research is recommended to focus more on habituation activities and guidance on waste sorting over a longer period of time. This aims to monitor the development of students' behavior on an ongoing basis and help them build positive habits in maintaining the cleanliness of the school environment and its surroundings.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

AUTHOR CONTRIBUTIONS STATEMENT

The development of this manuscript is the result of a collaborative effort, with each contributor playing a significant role. RNA and AA The desaigned the conceptual framework and methodology were thoughtfully designed to ensure a robust research foundation, supported by comprehensive supervision throughout the project. GS, RSA and MRS, conducted a literature review, followed by systematic data collection and initial analysis, which provided a solid basis for further refinement of the data and its interpretation. LMR and AA managedthe writing and editing processes were carefully managed to ensure clarity, coherence, and consistency in presenting the findings. Finally, RNA was reviewing and approving the final manuscript, ensuring its accuracy and integrity while collectively addressing the importance of waste management education as a solution to waste problems.

ACKNOWLEDGMENTS

We extend our deepest gratitude to to LP2M UIN Maulana Malik Ibrahim Malang and The Village of Sumberdem Malang Regency for providing resources and facilities that greatly contributed to the success of this work.

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