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Jurnal Pengabdian kepada Masyarakat
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Implementation of the PBLHS Movement Through Reducing Single-Use Plastic Waste at Al-Fatah Middle School

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Abstract
This community service activity aims to enhance the capacity of school members in implementing the Environmental Care and Culture Movement in Schools (GPBLHS) at SMP Al-Fatah Terboyo, Semarang City. The program was motivated by low environmental awareness and the high amount of single-use plastic waste within the school environment. The methods included training for teachers on integrating environmental themes into the curriculum, socialization of plastic waste reduction, and facilitation of reusable tumbler use among school members. Evaluation was conducted through pre- and post-tests to measure behavioral changes and waste reduction. The results indicated improved teacher competence in developing environmentally themed lesson plans and a decrease in inorganic waste volume from 30.9 kg to 3.8 kg after the program. This activity demonstrates that environmental education through curriculum integration and behavioral facilitation effectively supports Adiwiyata school initiatives toward sustainable and environmentally conscious schools.

Keywords: environmental education, PBLHS, adiwiyata school, single use plastic

INTRODUCTION

Semarang City has a mission as a sustainable city since 2022. [1], [2]In 2022, Semarang City produces 1,300 tons of waste every day with the largest contributor being household waste where the percentage of handled household waste reaches 72.10% [3]. The challenge in environmental management in Semarang City is that community participation only reaches 50% and the percentage of reduction in household waste or similar is only 27% in 2023. Low awareness has an impact on participation and action to reduce household waste which is a challenge for environmental management in Semarang City [4].

One of the areas that has environmental problems is Tambakrejo Village, Gayamsari District, which is located on the coast of Semarang City. This area experiences environmental problems in the form of tidal flooding due to land subsidence, flooding during the rainy season due to river overflows and environmental waste generation [5], [6], [7]. This condition is exacerbated by the residential area in Tambakrejo Village which has a high density with a density of 9178 residents / km2 with some slum areas / slum areas that have problems with limited Green Open Space (RTH) and waste that has not been managed properly, this is as

One indicator of a clean and healthy environment [8], [9]. Efforts to address this issue include household-level waste management through the establishment of waste banks and awareness-raising through the Environmental Care and Culture Movement in Schools (PBLHS).

Efforts made to realize sustainable environmental management are carried out through environmental education in schools [10]. Environmental-based lessons are expected to be able to utilize the surrounding environment, so there is a need for environmental-based learning in schools [11]. One of the educational programs that leads to efforts to instill awareness to behave wisely towards the environment is the Adiwiyata School Program [12]. Al-Fatah Middle School (in this community service activity acting as a partner) is one of the schools located in Tambakrejo Village that has

implemented the Adiwiyata school pilot action since 2023. Based on the school data profile, Al-Fatah Middle School has 14 teachers and 3 teaching staff and has 204 students consisting of 7 study groups (rombel).

The Adiwiyata School pilot activities at Al-Fatah Middle School that have been carried out include a joint commitment statement between Al-Fatah Middle School residents and the PGN Saka Muriah Energi Ltd (SEML) Community Development and Empowerment (PPM) program and the Semarang State University LPPM as well as the Socialization of the Environmental Care and Culture Movement in Schools (PBLHS) implemented by the Semarang City Environmental Service [13]. Based on the initial assessment, the waste produced by Al-Fatah Middle School residents in 1 day reached 35.9 kg of inorganic waste and 12.20 kg of organic waste. Most of the inorganic waste was produced by 2 canteens at Al-Fatah Middle School and other school residents' consumption activities. Through environmental education at the Adiwiyata school pilot at Al-Fatah Middle School, it became an effort to realize a sustainable environment in the school.

The implementation of the Adiwiyata School pilot at Al-Fatah Middle School is a response to increasing the capacity of the role of students and pupils in environmental conservation in the school environment and surrounding residential areas [14]. The challenges in implementing PBLHS at Al-Fatah Middle School are (a) Low student participation in changing waste reduction behavior in the school environment, which is indicated by the lack of students using their own drinking bottles (tumblers) and awareness in disposing of waste in its place, (b) The Adiwiyata cadre institution has not run optimally, where PBLHS campaign activities carried out by cadres are only incidental, (c) The integration of environmental-themed education in the school curriculum has not been optimal, and (d) The existence of waste originating from the activities of school residents has not been managed optimally, which is indicated by the presence of organic waste in the school environment and the use of disposable plastic by the school canteen.

Based on the problems faced by partners, through community service activities, we are trying to offer solutions in the form of capacity building for Adiwiyata cadres through institutional and leadership training in environmental conservation and waste reduction and sorting training in schools. Furthermore, we are integrating environmental education curricula to support the reduction of food waste in schools, and providing eating and drinking utensils to reduce waste from single-use packaging.

METHOD

Method for increasing environmental education capacity for partners is based on an analysis of the problem description and activity plan. Based on the problem descriptions encountered by partners, the program implementation method is as follows:

a. Group-based, all stages and types of activities will be carried out for all members of Al-Fatah Middle School together with the Adiwiyata School Movement Team. This includes training and mentoring on group management, planning, implementation, and monitoring of activities.
b. Comprehensive, to improve the knowledge and skills of all school members in implementing GPBLHS at Al-Fatah Middle School through plastic waste reduction activities. This activity focuses on management and human resources.
c. Based on Local Potential, knowledge and skills in environmental education are enhanced through the integration of an environmentally-themed curriculum into student learning. This is done to develop the management and human resources of Adiwiyata administrators.

The existence of these three methods is expected to have an impact on SMP Al-Fatah which is a fostered partner, both in terms of human resources and group management aspects. In accordance with the objectives of the activity, the methods that will be taken in this community service activity will be implemented in 4 (four) stages of activity, namely: (1) Socialization, (2) Competency Improvement, (3) Activity Implementation, and (4) Monitoring and Evaluation which are tested through a *pre-test* and *post-test system* .

RESULTS AND DISCUSSION

The implementation activities of the Environmental Culture Education Movement in Schools (GPBLHS) carried out at Al-Fatah Terboyo Middle School were carried out through several activities, including:

Environmentally Themed Curriculum Integration

The integration of the environmental-themed curriculum for students was carried out through training activities attended by the principal and teachers of Al-Fatah Middle School as target partners. Through this curriculum integration training, participants are expected to be able to implement environmental-themed learning that refers to six main themes, namely: cleanliness; sanitation and drainage functions; waste management; planting and maintaining trees or plants; water conservation; and energy conservation. The integration of these themes can be applied to collaborative or thematic subjects according to the characteristics of each field of study.

Figure 1Curriculum and EDS Integration Activities

The implementation of the six conservation education themes is not limited to Natural Sciences (IPA) subjects, but can also be integrated into non-science subjects. For example, in Physical Education, Sports, and Health (Penjasorkes) through outdoor activities in the form of environmental campaigns, and in Islamic Religious Education (PAI) through discussions of Quranic verses on environmental themes. These six conservation aspects do not have to be fully included in every Lesson Implementation Plan (RPP), but at least one aspect needs to be integrated in each RPP.

At this stage, curriculum integration is carried out through the development of environmental-themed lesson plans (RPPs), which also include components for assessing learning outcomes for each theme. Through this process, teachers are expected to strengthen the link between learning and environmental conservation and foster environmentally friendly behaviors among students.

The training concluded with a question-and-answer session between the speakers and participants. During the session, the speakers highlighted the importance of implementing innovative learning aspects in the lesson plans (RPPs). One challenge expressed by participants was that learning ideas considered innovative have sometimes been implemented elsewhere. In response, the speakers emphasized that innovation in learning can be achieved through the ATM (Observe, Imitate, and Modify) principle : observing good practices, imitating them with adjustments, and modifying them to suit the context of each school.

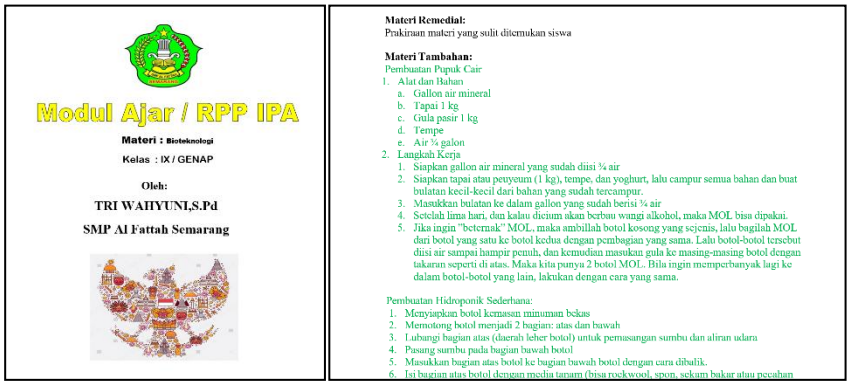

Figure 2Attachment to the Environmentally Themed RPP

Plastic Waste Reduction and Tumbler Facilitation

The series of single-use waste reduction activities began with a socialization regarding efforts to reduce plastic waste in the school environment on July 24, 2025, the socialization included raising

awareness regarding the negative impacts of plastic waste that is not managed properly and its impact on the environment. Furthermore, the activity of facilitating drinking bottles *(tumblr)* to all Adiwiyata school stakeholders including teachers, students, and canteen managers. The number of tumblers facilitated by the community service team was 250 plastic tumblers as an initial effort to reduce the use of single-use plastic waste in accordance with the principles of *reduce* and *reuse* , especially leftover plastic drinks in the canteen.

Figure 3Tumbler Facilitation and Plastic Waste Reduction Socialization

To determine the impact of plastic waste reduction interventions, initial measurements were conducted before the community empowerment program was implemented, and second measurements were conducted after several community empowerment programs. These measurements also served as practice in plastic waste sorting carried out by Adiwiyata cadres.

Figure 4Waste Sorting and Calculation Practices in Schools

The weighing results yielded a total of 7.25 kg of organic waste and 3.8 kg of inorganic waste. Compared to the previous pre-test results, the inorganic waste decreased significantly from 30.9 kg to just 3.8 kg. This demonstrates that the inorganic waste reduction program, implemented through various activities, has had a significant impact. Overall, the post-test and waste weighing activities provided a positive picture of increased student knowledge and behavioral changes in environmental management. These results demonstrate that Al-Fattah Islamic Middle School is increasingly ready to become an Adiwiyata school that cares about environmental preservation.

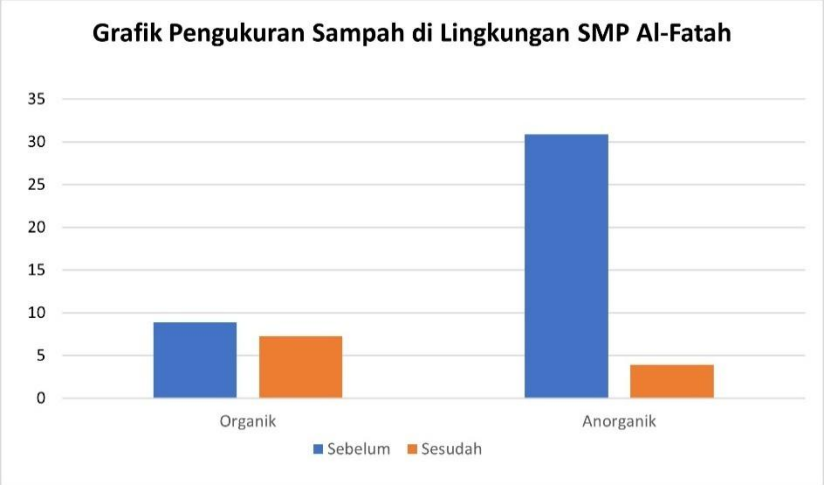

Figure 5Graph of Waste Measurement Results

CONCLUSION

Community service activities at Al-Fatah Middle School in Terboyo have successfully increased the capacity of teachers and students to implement the Environmental Care and Culture Movement in Schools (GPBLHS) through integrated curriculum training on environmental themes and the reduction of single-use plastic waste. This program has proven effective, reducing the volume of inorganic waste from 30.9 kg to 3.8 kg. The activity's strengths lie in the active participation of school residents and tangible results in waste reduction, while its weaknesses lie in the limited time available for mentoring. This activity has the potential to be developed into a project-based environmental learning model and long-term monitoring for the sustainability of environmentally friendly behavior in schools. Schools need to continue and expand the integration of environmental-themed curricula across various subjects and strengthen the role of Adiwiyata cadres in the management and innovation of environmental activities. Local governments and corporate partners are advised to support the sustainability of the program by providing environmental education facilities, waste management facilities, and continued mentoring based on school and community collaboration.

ACKNOWLEDGEMENT

This community service journal article is the result of the Community Service Program for Lecturers, funded by the 2025 Semarang State University DPA Fund.

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