

Character Building of Environmental Care Through the Utilization of Used Goods at SMP Negeri 9 Samarinda

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Abstract

The problem of waste in the school environment is still one of the problems that can affect the cleanliness and comfort of students. This study aims to describe the use of used gallons as garbage cans and identify the character of students' environmental care based on the observed behavior before and after the facility is placed in the classroom environment. This study uses a qualitative method with a case study approach which was carried out at SMP Negeri 9 Samarinda in August 2026. Data was collected through observation and documentation by observing students' habits in disposing of garbage, using garbage cans, and maintaining the cleanliness of the school environment. Used gallons are used as animal garbage cans and placed in the school environment. The results of the study show that the existence of waste cans from used gallons provides facilities that are easy for students to dispose of garbage in its place and support the habituation of environmentally caring behavior. The attractive shape of the garbage can is also a visual stimulus for students to use the facility. Thus, the use of used gallons as garbage cans can be a means of supporting the formation of character to care for the environment of students. However, sustainable character formation requires habituation, supervision, example, and support of all school residents.

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1. INTRODUCTION

The problem of waste in the school environment is still one of the environmental health problems that can affect the comfort and health of students. Poor waste control can make the environment dirty, cause odors, and increase the risk of health problems and reduce the comfort of doing activities at school [1]. Planned waste management, such as sorting, reducing, reusing, and recycling, can help create a clean school environment while increasing students' ecological awareness.

Research on waste management in junior high school students shows that waste management

knowledge and practice are crucial in building sustainable waste control attitudes in the school environment [2]. Schools have an important function in creating habits of caring for the environment because students spend most of their time studying and doing activities at school. Through the habit of throwing garbage in their place, maintaining the cleanliness of the classroom, and using cleaning facilities responsibly, students can develop the character of caring for the environment [3]. This condition is in line with research that shows a link between the application of sustainability principles in schools and students' behavior in sorting waste, so that the school environment can be an important space to form sustainable waste management habits [4]. Education and environmental management programs implemented sequentially can develop students' knowledge, involvement, and behavior in waste management [5].

Character formation is important because environmental care is not only driven by knowledge, but also by experience, motivation, social norms, and students' opportunities to take direct environmental action [6]. The character of environmental care in junior high school students can be seen through concern for environmental cleanliness, knowledge about waste management, and concern for greening and natural resource management [7]. According to [8], based on a meta-analysis of 169 studies with 176,007 participants. Environmental education contributes well to the improvement of knowledge, attitudes, intentions, and environmental behaviors of children and adolescents. Research on children's pro-environmental behaviors also shows that environmental education is one of the most researched external factors in the formation of pro-environmental behaviors, along with factors such as social norms and experiences of interacting with the environment [9]. A school environment that is supported by physical conditions, social norms, the support of school residents, and adequate facilities can create conditions that are more supportive of the formation of sustainable behavior in students [10].

Research on high school students in Jakarta shows that *environmental concern* Dominant against the pros *Environmental behavior* Students [11] Research on green school programs shows that better rates of implementation of environmental programs are related to more positive children's behavior in reducing and managing plastic waste [12]. Research [13] indicates that environmental education, knowledge, and facilities are related to the intention to sort and recycle waste. Therefore, the provision of adequate facilities can be one of the efforts to help students turn environmental knowledge and concern into tangible actions.

The availability of suitable garbage cans is an important part in supporting waste management practices in the educational environment because the existence of facilities can provide opportunities for students to dispose of and sort waste more easily [13]. Research on waste management at various levels of education shows that although most students consider recycling activities important, there are still discrepancies between the type of waste and the waste bins used as well as limited knowledge about the location of sorting facilities [14]. The findings show that the existence of facilities alone is not enough, but needs to be supported by education and facility management that suits the needs of students. School-based interventions that combine education with the provision of bins also show changes in students' understanding and practice in disposing of waste [15].

In addition to providing cleaning facilities, the use of used goods can also be an alternative in creating facilities that have utility value while supporting concern for the environment. The use of

recycled materials in school activities can also be part of efforts to introduce the principles of sustainability and waste management to students [16] One form of such utilization is the use of used plastic gallons as garbage cans with interesting shapes and decorations, such as animal characters. The use of used gallons as garbage cans has been applied in activities in the school environment and shows that used items can be turned into functional cleaning facilities [17]. Thus, the purpose of the activity is not directed at improving students' skills in managing used goods, but at the use of facilities as an environmental stimulus that can make it easier for students to dispose of waste appropriately. Research on school-based interventions shows that the availability, affordability, visibility, and placement of garbage cans can affect students' habits in disposing and sorting waste [18].

Waste management facilities that have an attractive design have the potential to be a visual stimulus for students. The activity of turning plastic waste into handicrafts such as flower pots is an important foundation in the formation of environmental care character which is expected to continue in students' daily habits, both at school and at home [19]. Research on visual media of waste management shows that infographics, mascots, images, and visual clues can increase the intention and behavior of waste sorting. Therefore, the animal-shaped trash can in this activity is expected to not only function as a garbage container, but also become an attractive, memorable visual marker and encourage students to enjoy it repeatedly in their daily lives [20].

Based on the above problems, the activity of using used gallons at SMP Negeri 9 Samarinda was carried out by making garbage cans in the shape of animals which were then placed in the classrooms. This research did not involve students in making garbage cans. The advantage of this research lies in the use of used plastic gallons as animal-shaped garbage cans that are placed directly in the classroom as a supporting facility to create character creators who care for the environment of students. This study aims to describe the use of used gallons as garbage cans and identify the character of students' environmental care based on the behavior observed before and after the facility is placed in the classroom. This finding is expected to contribute to building the characteristics of students' awareness of environmental cleanliness.

2. METHOD

This study uses a qualitative method with a case study approach in the form of the implementation of the BERSIH Program carried out at SMP Negeri 9 Samarinda to examine the use of used goods and their impact on the development of environmental care character [21]. The subjects observed were students who participated in a series of used goods recycling activities in the work program, which was carried out in August 2026 with a series of socialization, sorting of used goods, the manufacturing process, and the placement of garbage cans in the classroom hallway.

To understand the level of students' understanding before and after the activity, initial observations were made. Based on the first lesson, most students did not understand the concept of garbage grouping and did not understand the opportunities for the use of waste used goods to be used as handicraft products. Therefore, this observation became the basis for determining the next steps in utilizing used goods to develop the character of caring for the environment [19].

The qualitative method with a case study approach is used because this study aims to gain a deep understanding of the process of forming the character of caring for the environment through the reuse of recycled used gallons as garbage cans at SMP Negeri 9 Samarinda. This research was carried

out after the implementation of recycling socialization using used gallons that have been recycled as garbage cans as an effort to instill the value of environmental awareness character to students at SMP Negeri 9 Samarinda [22].

This research was conducted at SMP Negeri 9 Samarinda, East Kalimantan, in August 2026. The location was chosen because it is in line with the focus on strengthening environmental awareness through the use of recycled materials as garbage cans, as part of efforts to instill the value of environmental care in SMP Negeri 9 Samarinda students. Data from observations and documentation were analyzed using an interactive data model that focused on students' habits in disposing of waste properly, using the trash cans provided, and maintaining the cleanliness of the classroom. The findings were presented narratively and then processed into conclusions. The validity of the data was verified through triangulation techniques, which involved comparing the results of observations with photo documentation and field notes.

The research activity was carried out in several stages. The first step was to make a garbage can by utilizing used gallons that had never been used as the main material. After that, the gallons were washed and dried and then shaped and decorated until they were shaped into various animals. The entire formation process was carried out by 6 KKN students. Students were not involved in the process of making garbage cans. This was done because the focus of the students was observing how they used the facility and the changes that occurred after the facilities were available.

Data acquisition was carried out through observation and documentation. Observation was carried out directly by 6 KKN students who acted as observers during the entire series of used gallon recycling activities as innovative garbage cans as an environmental care character formation carried out during the series of BERSIH programs. Observations refer to observation sheets and field notes to assess indicators on students' habits in disposing of garbage correctly, the use of the garbage cans provided, and maintaining the cleanliness of the classroom [23].

3. RESULTS AND DISCUSSION

USE OF USED GALLONS AS GARBAGE CANS

The results of this activity show that used plastic gallons can be reused as waste containers with a new function in the environment of SMP Negeri 9 Samarinda. Gallons that were previously not used are now used as waste containers with shapes and decorations that resemble animal characters. This use shows that used plastic materials can be used through the process *Upcycling* so that it has a use and does not end up as waste. According to [24], the use of plastic waste as a functional product has also been applied in educational activities.

The use of used gallons in this activity also produces cleaning facilities that can be easily used by students. The reuse of used materials in schools can be a form of implementing waste control that not only focuses on disposal, but also on the reuse of materials that still have a function. Research on waste control in schools shows that school facilities are related to the practice of reducing plastic waste by students. According to Muti'ah et al. [25], school facilities are one of the factors studied in relation to the practice of restricting the use of plastic, especially for first-graders in Samarinda. Thus, the existence of waste cans from used gallons can be part of efforts to procure facilities that support waste control in the school environment.



Figure 1: Animal-Themed Trash Can

In addition to serving as a garbage container, the use of used gallons as a cleaning facility shows that used goods can be turned into more attractive products through a simple design that suits the school environment. Research on creative recycling (*Upcycling*) plastic materials show that the transformation of used goods into functional products can act as a catalyst for the reuse of such materials in educational environments Wati and Ary [26]. This shows that the use of used gallons in this activity not only creates a trash can, but also highlights the application of the principle of reusing previously unused items. As a result, used gallons, which have the potential to become garbage, can be turned into hygiene facilities that are beneficial to the school environment.

STUDENTS' CONDITIONS BEFORE AND AFTER THE PLACEMENT OF THE GARBAGE CAN

The initial observation was carried out before the used gallon trash can was placed in the classroom to obtain an overview of the cleanliness condition of the classroom environment and students' habits in managing waste. The observation was focused on students' habits in disposing of garbage, the use of available cleaning facilities, and the condition of the classroom environment. This initial observation was carried out as a comparative condition to determine the change in student behavior after the waste gallon trash can was available and could be used in daily activities.

Based on the results of initial observations, the condition of the classroom environment has not fully demonstrated good waste management habits. There are still garbage that has not been placed in the proper disposal site. This condition shows that the habit of throwing garbage in the right place has not been carried out stably by all students. This is one of the illustrations that environmental care behavior still needs to be strengthened through repeated habits in the school environment. This condition also shows that the existence of environmentally caring behavior is not only related to the will of students, but also related to the availability of an environment that supports students to carry out these actions. When waste disposal facilities are not adequately available or have not become a part of the classroom environment, students' opportunities to get used to the behavior of throwing garbage in their place become more limited. Therefore, this initial condition is an important basis in the implementation of used gallon waste disposal activities as garbage cans.

In addition to paying attention to the presence of waste, initial observations are also directed at how students interact with the classroom environment during learning activities and daily activities at school. The cleanliness of the school environment is basically a shared responsibility of all school residents. Simple behaviors such as throwing away garbage after eating or after using an object,

maintaining the area around the school, and not letting garbage scatter are real actions that can be part of the character of caring for the environment. If these behaviors have not been carried out consistently, environmental support is needed that can help students build these habits. The findings in this initial condition are in line with [2] which shows that waste management knowledge and practices are an important part of forming sustainable waste control habits in junior high school students. This means that concern for the environment needs to be manifested in the form of real actions, not an understanding of the importance of cleanliness. Students need to have the opportunity to apply these behaviors directly in the environment where they operate. Huoponen [6] also explains that adolescents' pro-environmental behavior in the context of schools is related to various factors, one of which is the opportunity and environmental support to carry out pro-environmental actions. In the context of this study, the conditions before the placement of the garbage can show that the formation of environmental care characters still requires the support of facilities that students can use directly.

Thus, the initial condition of students is an illustration that waste management habits in schools still need to be strengthened. Initial observation is not intended to provide an assessment that students do not have concern for the environment, but to see the form of behavior that appears before the existence of additional facilities. These conditions are then the basis for seeing how the existence of waste cans from used gallons can provide space for students to carry out environmental care activities in school life. After the waste gallon trash can in the shape of an animal is placed in the classroom hallway. Observation after placement is carried out by paying attention to several indicators, namely students' habits of throwing garbage in its place, the use of prepared garbage cans, school hygiene conditions, and students' concern for garbage in the surrounding environment. These indicators are used to see changes in behavior that appear after students obtain new garbage disposal facilities.

The results of observation after placement show that the existence of the garbage can provides a means that students can use directly when producing waste. Facilities that were previously not available in the form of the use of used gallons then become part of the school environment. The existence of these facilities makes it easy for students to dispose of waste without having to leave the classroom environment or look for other disposal sites. Thus, the garbage can not only functions as a container, but also as a means that makes the emergence of environmentally caring behaviors. The availability of these facilities is important because the behavior of disposing of garbage in its place requires the opportunity to be done in real terms. When the garbage can is in an easily accessible environment, students have facilities that can be used immediately after producing waste. This condition allows the behavior of throwing garbage in its place to be carried out repeatedly so that it has the potential to develop into a habit. In other words, through the provision of garbage cans, it can provide a stimulus that supports the formation of environmentally caring behaviors.

In addition to the availability factor, the characteristics of the animal-shaped trash can provide a different visual element from ordinary trash cans. This shape makes the facility easier to recognize and can attract students' attention. Visual attraction is one of the elements that can help the facility be more visible in the classroom environment. You et al. [27] showed that an attractive design in the context of waste management can support waste management awareness and behavior. The use of used gallons as a bin material also gives additional meaning to this activity. Thus, students are not

only dealing with waste disposal facilities, but also with real-world examples that used goods can still be reused. Although students are not involved in the manufacturing process, the presence of such products in the school environment can be a form of stimulus that introduces the practice of reusing used goods in daily life.

Changes after the placement of the garbage can are then seen through the behavior of students in using the facilities, disposing of garbage in its place, and maintaining the cleanliness of the school environment. When students use the available facilities and the garbage is more directed to the landfill, this condition can be seen as an early indication of the emergence of environmental care behavior. This behavior is important because the character of caring for the environment is not only shown through knowledge about the environment, but also through real actions carried out in daily life.

The findings are in accordance with Tanjung et al. [13], which shows that facilities are one of the factors related to the intention to sort and recycle waste. The availability of facilities provides an opportunity for individuals to implement waste management behavior directly. In the context of this study, waste bins made of used gallons are a simple facility that can help students practice the habit of disposing of garbage in its place. The existence of garbage cans cannot directly prove that the character of caring for the environment has been permanently formed. Character requires a habitual process that is carried out repeatedly and regularly. Therefore, the use of garbage cans after placement is more appropriately understood as a form of environmental support for the process of forming the character of caring for the environment.

Rahmania [10] explained that the sustainable behavior of children and adolescents is influenced by various factors, including the condition of the school environment, facilities, social norms, knowledge, attitudes, motivation, and support from the surrounding environment. This shows that changes in student behavior do not stand alone, but are influenced by the environment in which the behavior is carried out. In this study, the placement of the garbage can is one of the changes in the physical environment of the classroom that provides opportunities for students to take actions to care for the environment. Thus, the condition after the placement of the garbage can show that the use of used gallons can provide two benefits at once. First, used gallons acquire a new function as a cleaning facility so that they can reduce items that have the potential to become waste. Second, the facility can be used directly by students who then support the habit of throwing garbage in its place. This strengthens that the use of used goods can not only be seen from the results of the product, but also from the function of the product in supporting environmentally caring behavior.

The changes seen after the placement of the garbage can are also the basis for understanding that the formation of a character of caring for the environment can be started from simple actions that are carried out repeatedly. The habit of using garbage cans, maintaining the cleanliness of the school environment, and not letting garbage scatter are simple actions, but if done consistently, they can be part of the behavior of caring for the environment of students. Therefore, the facilities that have been placed need to continue to be used and supported by habituation, supervision, and examples from school residents so that behavior changes can be maintained in the long term.

CHARACTER FORMATION OF CARING FOR THE ENVIRONMENT THROUGH HABITUATION

The cultivation of environmental care for students can be seen through simple habits, such as throwing garbage in its place and maintaining school cleanliness. In this study, the placement of

waste cans from used gallons provides facilities that are easy for students to reach so that they can support the habituation of these behaviors. With the availability of garbage cans in the environment directly in daily activities.

The use of used gallons as garbage cans also shows that unused items can be reused into something useful. The shape of the garbage can that resembles an animal provides an attractive visual appearance so that it can be an encouragement for students to pay attention and use the facility. This is in line with [27] which shows that visual elements and attractive designs can support children's awareness and behavior in disposing of garbage. These facilities act as supporters that need to be accompanied by habituation, supervision, example, and support from the school environment. Thus, the use of used gallons as garbage cans can be one of the means that support the cultivation of environmental care through the habit of throwing garbage and maintaining cleanliness in a sustainable manner.

4. CONCLUSION

This study found that the animal-shaped garbage cans made from used gallons were easy for students at SMP Negeri 9 Samarinda to reach and use in the classroom. Before the garbage cans were placed, waste disposal in the classroom was not yet consistent; after placement, students used the facility directly and garbage was more directed to the garbage can, which was interpreted as an early indication of environmentally caring behavior. The animal-shaped design was also observed to attract students' attention, and the use of used gallons showed that unused goods can be reused as a functional facility. These findings are limited to one school, one observation period in August 2026, and descriptive observation by 6 KKN students. They cannot be generalized, and they do not show that the garbage cans caused the formation of environmental care character. Students were also not involved in making the garbage cans, and the study did not include a quantitative measurement of behavior change. Future studies are recommended to observe more classes or schools over a longer period, to combine observation with interviews or questionnaires, and to involve students in making and maintaining the garbage cans. Schools are advised to support the facility with consistent habituation, supervision, role modeling, and environmental education.

5. BIBLIOGRAPHY

- [1] S. R. Karimuna *et al.*, "PERILAKU MEMBUANG SAMPAH SEMBARANGAN PADA SISWA DI LINGKUNGAN SEKOLAH DI SD 100 KENDARI," *J. Kesehat. Ilm. Indones.*, vol. 11, no. 1, 2026, [Online]. Available: <https://doi.org/10.51933/health.v11i1.2732>
- [2] S. A. Mahayuddin, N. R. Ishak, and W. A. Z. W. Zaharuddin, "ASSESSING THE LEVEL OF KNOWLEDGE AND PRACTICES OF WASTE MANAGEMENT AMONG," *Malaysian J. Sustain. Environ.*, vol. 11, no. 2, pp. 281–296, 2024, doi: 10.24191/myse.v11i2.1719.
- [3] W. Purnami, "Pengelolaan sampah di lingkungan sekolah untuk meningkatkan kesadaran ekologi siswa," *J. Pendidik. IPA*, vol. 9, no. 2, pp. 110–116, 2020, doi: 10.20961/inkuiri.v9i2.50083.
- [4] F. G. Muhaimin, K. Anindita, W. Pitaloka, D. Qomaria, S. Fitriana, and R. M. Pakpahan, "The Relationship between the Application of Sustainable Principles and Students' Waste Segregation Behavior at SMAN 1 Singosari," *Indones. J. Biol. Educ.*, vol. 5, no. 1, pp. 42–46, 2022, doi: 10.31002/ijobe.v5i1.6027.
- [5] R. Yusuf and I. Fajri, "Differences in behavior, engagement and environmental knowledge on

- waste management for science and social students through the campus program,” *Heliyon*, vol. 8, no. 2, p. e08912, Feb. 2022, doi: 10.1016/j.heliyon.2022.e08912.
- [6] A. Huoponen, “From concern to behavior: barriers and enablers of adolescents’ pro-environmental behavior in a school context,” *Environ. Educ. Res.*, vol. 30, no. 5, pp. 677–699, May 2024, doi: 10.1080/13504622.2023.2180374.
- [7] D. Purwaningsih, M. Faizal, and A. Husin, “Evaluation of Students’ Environmental Care Characters at Adiwiyata School (Case Study of SMPN 19 Palembang),” *J. Lingkungan. Hidup Sriwij.*, vol. 7, no. 2, pp. 67–72, 2022, doi: 10.22135/sje.2022.7.2.67-72.
- [8] J. Van De Wetering, P. Leijten, J. Spitzer, and S. Thomaes, “Does environmental education benefit environmental outcomes in children and adolescents ? A meta-analysis,” *J. Environ. Psychol.*, vol. 81, no. February 2021, p. 101782, 2022, doi: 10.1016/j.jenvp.2022.101782.
- [9] J. Liu and R. J. Green, “Resources , Conservation & Recycling Children ’ s pro-environmental behaviour : A systematic review of the literature,” *Resour. Conserv. Recycl.*, vol. 205, no. February, p. 107524, 2024, doi: 10.1016/j.resconrec.2024.107524.
- [10] T. Rahmania, “Heliyon Exploring school environmental psychology in children and adolescents : The influence of environmental and psychosocial factors on sustainable behavior in Indonesia,” *Heliyon*, vol. 10, no. 18, p. e37881, 2024, doi: 10.1016/j.heliyon.2024.e37881.
- [11] G. C. Puspaningrum, I. M. Putrawan, and R. Djamahar, “PENGARUH ENVIRONMENTAL CONCERN DAN NEW ENVIRONMENTAL PARADIGM TERHADAP PRO-ENVIRONMENTAL BEHAVIOR PESERTA DIDIK SMA NEGERI DI JAKARTA,” *Indones. J. Environ. Educ. Manag.*, vol. 8, no. 1, pp. 32–44, 2023, doi: 10.21009/ijeem.v8i1.33537.
- [12] C. Salazar, M. Jaime, M. Leiva, and N. González, “Environmental education and children’s pro-environmental behavior on plastic waste. Evidence from the green school certification program in Chile,” *Int. J. Educ. Dev.*, vol. 109, p. 103106, 2024, doi: <https://doi.org/10.1016/j.ijedudev.2024.103106>.
- [13] A. Tanjung, I. Rachman, and T. Matsumoto, “The impact of environmental education, knowledge, and facility on pre-service teachers’ intention toward waste separation and recycling on campus: teacher education institution in Indonesia case study,” *J. Mater. Cycles Waste Manag.*, vol. 26, no. 6, pp. 3917–3927, 2024, doi: 10.1007/s10163-024-02043-0.
- [14] B. Sena Sağlam and N. Aydın, “Investigation of waste characteristics and recycling behaviour at educational institutes,” *Waste Manag.*, vol. 180, pp. 115–124, 2024, doi: <https://doi.org/10.1016/j.wasman.2024.03.036>.
- [15] W. Phothisawang, T. Apornpong, and N. Arpornpong, “Effects of Source-Based Waste Management Awareness on Waste Segregation Behavior Among Lower Secondary School Students in Thailand : A Case Study of Phitsanulok Province,” *Sustainability*, vol. 18, no. 3101, pp. 1–22, 2026, doi: 10.3390/su18063101.
- [16] I. Royani and R. Tjahyaningsih, “Utilizing Recycled Materials as Innovative Educational Media to Enhance Early Childhood Learning,” *Int. J. Educ. Comput. Stud.*, vol. 5, no. 2, pp. 196–203, 2025, doi: 10.35870/ijecs.v5i2.5077.
- [17] N. Al Maida, W. Maslahah, and L. Rofiah, “Sosialisasi Kebersihan Lingkungan Sekolah dan Pemanfaatan Galon Bekas Menjadi Tempat Sampah di MI Bustanul Ulum,” *J. Pengabd. Kpd. Masy.*, vol. 7, no. 2, 2025, doi: 10.33379/attamkin.v7i2.6425.
- [18] W. Boonchieng, K. Intawong, J. Wungrath, A. Thongprachum, and W. Naksen, “Development of a School-based Intervention Program for Waste Management in a Rural School in Northern Thailand Abstract:,” *Open Public Health J.*, vol. 16, no. 23, pp. 1–7, 2023, doi: 10.2174/18749445-v16-230810-2023-72.
- [19] I. M. Tamba, P. D. Kumalasari, N. N. Putriani, and I. G. A. K. Agung, “EDUKASI PEMILAHAN DAN DAUR ULANG SAMPAH PLASTIK SE-SD NEGERI DI DESA

- CELUK,” *J. Abdi Dharma Masy.*, vol. 6, no. 1, pp. 51–58, 2025, doi: 10.36733/jadma.v6i1.11806.
- [20] N. Leeabai *et al.*, “The integrated study of the effects of infographic design on waste separation behavior and the behavioral outcome implementation on waste composting,” *Waste Manag.*, vol. 169, pp. 276–285, 2023, doi: <https://doi.org/10.1016/j.wasman.2023.07.019>.
- [21] I. Rohmah and U. A. Sari, “Dinamika Sosial : Jurnal Pendidikan Ilmu Pengetahuan Sosial DAMPAK PENERAPAN WASTE MANAGEMENT TERHADAP,” *J. Pendidik. Ilmu Pengetah. Sos.*, vol. 5, no. 1, pp. 240–250, 2026, doi: 10.18860/dsjpips.v5i1.19520.
- [22] U. Inayati, Z. Hani, S. Sho’imah, and A. Nafiah, “INTERNALISASI NILAI KARAKTER PEDULI LINGKUNGAN MELALUI PEMANFAATAN DAUR ULANG WADAH CAT SEBAGAI TEMPAT SAMPAH DI MADRASAH IBTIDAIYAH MADINATUL ULUM PASINAN BAURENO,” *J. Media Akad.*, vol. 4, no. 3, pp. 1–10, 2026, doi: 10.62281/zsk77q52.
- [23] F. Zahro and R. R. Balqis, “Pembelajaran Seni Rupa Berbasis Daur Ulang dalam Menumbuhkan Sikap Peduli Lingkungan Siswa MI pada Program Adiwiyata,” *J. Prim. Educ.*, vol. 9, no. 1, pp. 30–41, 2026, doi: 10.24014/ejpe.v9i1.39187.
- [24] Y. Arya *et al.*, “PEMANFAATAN SAMPAH PLASTIK MENJADI PRODUK UPCYCLE UNTUK MENINGKATKAN KREATIVITAS SISWA SD NEGERI 4 SENGANAN TABANAN,” *J. Pengabd. Kpd. Masy.*, vol. 19, no. 2, pp. 293–300, 2022, doi: 10.21009/sarwahita.192.5.
- [25] S. Muti’ah, V. Pramaningsih, and Rusdi, “Analisa Pengetahuan , Sikap , Fasilitas Sekolah Terhadap Tindakan Mengurangi Penggunaan Plastik Sekali Pakai di Sekolah Menengah Pertama Analysis of Knowledge , Attitudes , and School Facilities toward the Practice of Reducing Single-Use Plastic in Junior,” *Bul. Kesehat. Lingkung. Masyarakat*, vol. 45, no. 2, pp. 173–181, 2026, doi: 10.31983/keslingmas.v45i2.15016.
- [26] A. Wati and D. Ary, “Analysis of Students ’ Creativity Level through Upcycling Crafts from Used Plastic in Class IV Elementary School,” *Sekol. Dasar Kaji. Teor. dan Prakt. Pendidik.*, vol. 34, no. 01, pp. 113–128, 2025, doi: 10.17977/um009v34i12025p113-128.
- [27] Z. You, T. Yang, Z. Li, Y. Li, and M. Zhong, “Interactive Educational Toy Design Strategies for Promoting Young Children ’ s Garbage-Sorting Behavior and Awareness,” *J. Environ. Res. Public Heal.*, vol. 20, 2023, doi: 10.3390/ijerph20054460.