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Original Paper

Implementation of Project Management in Waste Management Based on 3 R (Reduce, Reuse, Recycle)

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Abstract
The purpose of this project is to develop a sustainable waste management system at SMP Fikri Junior High School (SMP) Jakarta by introducing recycling, reuse, and active involvement from all school components. The project follows a five-phase Project Management approach: Initiation to define goals based on 3R principles (Reduce, Reuse, Recycle); Planning for resource and activity design; Implementation, including waste sorting and awareness campaigns; Monitoring to track progress and gather feedback; and Closure to evaluate outcomes and propose long-term strategies. Key results include improved operational systems for waste handling, enhanced environmental awareness among students, teachers, and staff, and the creation of a sustainable waste management model. The project promoted hands-on learning about 3R practices, increased efficiency in managing school waste, and encouraged community-wide participation. As a result, the school environment became cleaner, healthier, and more environmentally friendly. Despite initial challenges, these were addressed through consistent education and recycling efforts, leading to a lasting impact on school culture and environmental responsibility.

Keywords: Reduce, Reuse, Recycle

JEL Classification: Q53, M14, L12

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1. Introduction
The problem of waste is one of the major challenges faced by modern society, including in educational environments such as schools. Data from the Ministry of Environment and Forestry (KLHK) shows that Indonesia produces more than 60 million tons of waste each year, with around 15% of this amount coming from the public sector, including schools. Most of this waste ends up in landfills without adequate processing, which can have negative impacts on the environment and public health (Ministry of Environment and Forestry (KLHK), 2020). Schools as educational institutions, have an important role in instilling environmental awareness values in students. Through educational programs implemented in schools, students not only learn theory in the classroom but are also expected to be able to apply environmental care values in everyday life (Haul et al., 2021). One effort that can be made is to manage school waste effectively through the application of the Reduce, Reuse, Recycle (3R) principle

Reduce, Reuse, Recycle (3R) is a strategy that has been widely recognized globally as an effective approach to reducing waste volume and improving environmental sustainability. Reduce means reducing waste production from the start, reuse means reusing items that are still usable, and recycling means materials that can be reprocessed into new items (Ayuningtyas, 2019). The implementation of 3R is important to reduce the burden on the environment and save increasingly limited natural resources (2023).

In the school environment, the volume of waste produced every day is quite significant, especially from organic and inorganic waste such as food scraps, plastic, and paper. Improper waste management in schools often leads to uncontrolled waste accumulation, as well as a lack of awareness among students and school staff about the importance of sustainable waste management (Khairani et al., 2024). This results in the school environment becoming dirty and has the potential to cause various health problems, such as the spread of disease and environmental pollution (Agustin et al., 2022).

"Management is the process of planning, organizing, directing, and controlling the resources available to achieve goals effectively and efficiently."(Ramaditya, M., Effendi, S., Faruqi, F., & Darmawan, A., 2022). Based on the journal written by Maronrong, R., Arina, AA, Ramaditya, M., & Faruqi, F. (2022) entitled "Talent Management System for Learning Organizations and Employee Engagement at PT Hipernet Indodata Head Office," the definition of management is not explained explicitly in the form of a formal definition. However, in the context of this research, talent management is defined as a strategic process that includes the identification, development, and retention of talented individuals within an organization to achieve business goals and increase employee engagement.

Therefore, it is necessary to implement good project management in managing waste in schools by integrating the 3R concept. Project management is a systematic approach to planning, organizing, implementing, and evaluating a project so that the desired goals are achieved effectively and efficiently. By using a project management approach, schools can plan a more comprehensive waste management strategy, starting from waste sorting and educational campaigns for students to reusing used goods (Kerzner. H, 2017).

The implementation of a 3R-based waste management program through project management can also increase active student involvement, which not only reduces the negative environmental impact of waste but also forms the character of students who care more about the environment and support sustainability efforts (Nawawi et al., 2024). Thus, the implementation of project management in 3R-based waste management in schools is expected to be an effective solution to create a clean, healthy, and environmentally friendly school environment.

The main issue is the unregulated production and inadequate handling of waste at schools, which has a detrimental impact on the public's health and the school environment while also making a substantial contribution to the nation's overall waste volume. Even though they are educational establishments, many schools lack efficient waste management systems, which leads to trash buildup, filthy surroundings, contamination of the environment, and possible health hazards for both employees and students. The issue stems from inefficient waste management in schools, which causes problems for the environment and human health. In addition to being an environmental requirement, using project management to implement the 3R method offers educators a chance to teach students long-term sustainability ideals.

2. Method

Location and time

SMP FIKRI is domiciled at Jalan Masjid Al Anfal No: 51, which is geographically located in Tugu Selatan Village, Koja District, easily accessible from all directions via many means of transportation. SMP Fikri has implemented the latest curriculum, namely the independent curriculum, in its learning process. In its journey, SMP Fikri will continue to develop physically to

meet the needs of learning facilities for all students. In addition, the quality of learning continues to be improved to meet the needs of the industry that expects graduates who are skilled and competent in their fields.

Currently, SMP Fikri Jakarta is led by Mr. M. Romdloni, MAg, together with colleagues, a team of teachers and other employees to build SMP Fikri to be more advanced and make it the best school choice for the people of North Jakarta for their children's education.

Method Project Based Learning

Project-based learning (PBL) is a method that places students at the center of learning. Students are actively involved in real projects related to real-world problems, such as 3R-based waste management in the school environment. This method combines theoretical and practical aspects, with the aim that students can directly understand the importance of sustainable waste management and participate in the process.

Stages in Project-Based Learning

Project Identification. In the initial stage, teachers and students together identify the project to be worked on, namely 3R-based waste management (Reduce, Reuse, Recycle) at school. Students are invited to discuss the problems faced by schools related to waste, such as the increasing amount of waste, lack of awareness to separate waste, and the negative impact of waste on the environment.

Formulate Essential Questions. The teacher directs students to formulate the main questions that will be the focus of the project. These questions are usually related to how students can help reduce waste in schools through the 3R concept. Examples of essential questions are: What is an effective way to reduce the volume of waste in schools? How can the 3R concept be applied in schools to increase environmental awareness?

Project Planning. After the main question is formulated, students are guided to create a project plan. At this stage, students will identify the steps that need to be taken, the resources needed, and the parties that must be involved, such as Determining the area in the school that will be the focus of the project (classroom, cafeteria, school garden). Planning a waste reduction campaign, reusing goods, and recycling programs. Preparing tools and materials such as separate bins for waste sorting, recycling tools, and educational materials.

Methodology Used

Project Management Approach is project management is an approach or method to manage a project effectively and efficiently. This methodology follows the formal stages of project management, which include:

1. Project Initiation: Identification of the problem (e.g., high volume of waste in schools) and determination of the project objective (reducing waste by implementing the 3Rs).
2. Project Planning: Making detailed plans about the steps of implementing 3R, scheduling activities, allocating resources, and assigning tasks to the project team (e.g., students in charge of recycling activities, awareness campaigns, etc.).
3. Project Implementation: Carrying out planned activities, such as waste separation, waste reduction campaigns, and training on reuse and recycling.
4. Project Monitoring and Control: Regular monitoring of results achieved, including reduction in waste volume and success of recycling programs.
5. Project Closing: Evaluate the final results of the project, lessons learned, and recommendations for future improvements.

3. Results

Required Data Sources

In implementing project management for 3R (Reduce, Reuse, Recycle) based waste management in schools, the various resources needed will cover the following aspects:

Human Resources

1. Students: As the main implementers, they will participate in waste sorting activities, awareness campaigns, and processing waste that can be recycled or reused.
2. Teacher: Serves as a facilitator and mentor, monitors project implementation and provides direction in technical and educational matters.
3. Cleaning Staff: Cooperate in waste management, especially in terms of collecting, sorting and disposing of non-recyclable waste.
4. Principal/School Management: Provides policy support and provides the budget or facilities required for project implementation.
5. External Communities: These can be recycling agencies, local governments (e.g., the Department of Environmental Protection), or environmental organizations that provide training, materials, and support for project implementation.

Physical and Material Resources

1. Separate Trash Bins: Separate trash bins are required for organic waste, non-organic waste, and recyclable waste. These trash bins should be placed at various strategic points in the school environment.

Source id.pngtree.com

Figure 1. Typical school trash bins

2. Waste Processing Tools: For example, a composter to process organic waste into compost, as well as simple tools to recycle plastic or paper.
3. Educational Posters and Campaign Media: Promotional media is needed to educate students and staff on how to sort waste and the importance of 3R. Posters, banners, or digital media such as videos can be used.
4. Eco-Friendly Alternative Products: For example, providing reusable drinking bottles to reduce the use of single-use plastic, or cloth bags instead of plastic bags.

Source: Semarang City Government

Figure 2. Waste management with 3R

Financial Resources

1. Funds for Procurement of Tools and Materials: Funds are required for the procurement of separate trash bins, recycling equipment, composters, and campaign materials such as posters or props.
2. Training Costs: If training on recycling or composting techniques is required, it may cost to bring in a trainer or purchase training materials.
3. Operating Budget: Funds for the daily operating costs of the project, such as costs for transportation when working with recycling agencies or costs for disposing of non-recyclable waste.

Time Resources

1. Planning Time: Proper planning of the project, including conducting an initial survey of the school's waste management, takes time.
2. Project Implementation Time: Implementation must be adjusted to the school's academic calendar and involve activities such as daily waste management, campaigns, and evaluations.
3. Education Time: Time to conduct education and training sessions for students and staff on understanding the 3R concept and sorting and recycling practices.

Technology Resources

1. Data Management Tools: Use simple software to record data on the amount of waste generated, sorted, recycled, or reduced. This data can be analyzed to determine the project's impact.
2. Social Media or School Website: This can be used for awareness campaigns and dissemination of project-related information to the entire school community, including publishing project results.

Educational and Information Resources

1. Educational Materials: Guides, modules, or textbooks related to the 3Rs and the concept of sustainable waste management. These materials are important to provide students with basic knowledge about the importance of reducing, reusing, and recycling.
2. Training: Internal and external training programs to improve the knowledge of students, teachers and staff on how to manage waste effectively according to the 3R principles.

3. The resources needed in a 3R-based waste management project in schools involve important elements such as human, material, financial, technology, and logistics. The success of this project will depend on how schools can manage these resources effectively and efficiently by involving the entire school community in an effort to maintain a clean and sustainable environment.

Project Analysis
Expected results

1. Increased Environmental Awareness: Students and staff have a better understanding of the impact of waste on the environment and the importance of proper management.
2. Waste Volume Reduction: A significant reduction in the amount of waste generated by schools is expected, with more waste being well managed.
3. Innovation and Creativity: Students can create products from used goods, enhancing their creativity and practical skills.
4. Model for Other Schools: SMP Fikri Jakarta can be an example for other schools in implementing 3R-based waste management.

Evaluation and Follow-up

1. Project Evaluation: After implementation, conduct an evaluation to measure the project's effectiveness, including measuring the volume of waste before and after implementation.
2. Follow-up: Plan ongoing programs to maintain student awareness and involvement in waste management, such as making this project part of the school curriculum.

The 3R-based waste management project at SMP Fikri Jakarta is a strategic step to increase environmental awareness among students and create a clean and healthy school. With a systematic approach and involving all parties, this project is expected to provide a sustainable positive impact on the school environment and its surroundings.

3R Work Program

The 3R work program in schools aims to instill awareness of the importance of protecting the environment from an early age in students. Here are some examples of 3R work programs that can be implemented in schools:
Reduce (Reduce):

Reducing paper usage:

1. Print as needed and print on both sides of the paper.
2. Using scrap paper for notes or assignments.
3. Replace notebooks with tablets or digital note-taking apps.

Reducing plastic use:
Bring a drinking container from home.

1. Use reusable cutlery.
2. Reduce the use of single-use plastics such as straws and plastic bags.

Reducing energy consumption:

1. Turn off lights and electronic equipment when not in use.
2. Use natural light whenever possible.
3. Utilize alternative energy, such as solar panels (if possible).

Reuse (Reusing):

1. Reusing drinking bottles: Students bring drinking bottles from home and refill them at the school dispenser.
2. Reusing shopping bags: Bring clothes or paper shopping bags when shopping.
3. Repairing broken items: Instead of throwing them away, students are taught to repair items that can still be used.
4. Recycling paper: Used paper is collected and recycled into new paper or made into handicrafts.

Recycle (Recycling):

1. Create separate trash bins: Provide trash bins for organic waste, paper, plastic, and other waste.
2. Making compost: Processing organic waste, such as food scraps, into compost to fertilize plants at school.
3. Please set up a mini waste bank: Collect recyclable waste and sell it to collectors.
4. Holding a recycling competition: Holding a competition to make crafts from used goods to improve students' creativity.

Other activities that can be done:

1. Environmental education: Carrying out teaching and learning activities about the importance of protecting the environment and how to manage waste.
2. 3R Campaign: Conducting 3R campaigns periodically to increase awareness among students and the entire school community.
3. Collaboration with communities: Collaborating with surrounding communities to carry out activities related to the environment.

Benefits of the 3R program in schools:

1. Increasing environmental awareness: Students will care more about the environment and get used to throwing trash in the right place.
2. Cultivating a thrifty attitude: Students are taught to appreciate natural resources and not to be wasteful.
3. Enhancing creativity: Through recycling activities, students can develop creativity and imagination.
4. Creating a clean and healthy school environment: Schools will be cleaner and more comfortable for learning.

Awareness of the importance of waste management in the school environment

Awareness of the importance of waste management in the school environment should be increased. Many schools have integrated environmental education and waste management into their curriculum. However, the level of awareness and implementation still varies between schools and students.

Several factors cause awareness of the importance of waste management in school to below:

1. Lack of Engaging Education: Material on waste management is often considered boring and irrelevant to students.
2. Lack of Practical Examples: The lack of real examples of good waste management in the school environment makes it difficult for students to understand the importance of this.
3. Lack of Facilities: The absence of adequate and separate trash bins and recycling facilities makes it difficult for students to sort their trash.
4. Lack of Discipline Enforcement: Lack of supervision and sanctions for students who litter makes them less concerned.

Things that can be done to raise awareness

1. Organize interesting educational activities: For example, poster competitions, recycling workshops, or visits to landfills.
2. Create school policies that support waste management, Such as requiring waste sorting, providing adequate trash bins, and involving students in cleaning activities.
3. Collaborating with communities: Partnering with environmental organizations or surrounding communities to hold joint activities.
4. Leveraging technology: Using social media or apps to disseminate information and engage students in participation.

Raising awareness of the importance of waste management in schools is an investment for the future. By providing the right education, adequate facilities, and support from all parties, we can create a generation that cares about the environment and is able to maintain the sustainability of the earth.

Obstacles Faced and Their Solutions

Lack of Student Awareness and Knowledge

1. Constraints: Many students do not understand the concept of 3R and the importance of good waste management, so they participate less in this program.
2. Solution: Conduct regular outreach and training on the importance of 3R.
3. Integrating waste management material into the curriculum so that students understand the impact of waste on the environment.
4. Holding competitions or contests related to 3R to increase student interest and participation.

Resistance to Habit Change

1. Challenges: Students and staff may find it difficult to change their old habits of disposing of waste, especially when separating different types of waste.
2. Solution: Provide ongoing education about the positive impacts of waste sorting.
3. Provide clear and easy-to-understand instructions regarding waste separation in the bins provided.
4. Holding regular "clean day" campaigns, where all parties are involved in cleaning and sorting waste in the school environment.

Inadequate Infrastructure

1. Constraints: Lack of facilities, such as adequate, separate waste bins and composters, can hinder the program's effectiveness.
2. Solution: Hold fundraising or collaborate with external parties (such as sponsors) to provide the necessary facilities.
3. Involving students in the process of making a simple composter from recycled materials as part of practical learning.

Lack of Monitoring and Evaluation

1. Constraint: It is difficult to measure project success if there is no clear monitoring and evaluation system.
2. Solution: Form a special team that is responsible for monitoring and evaluating the program periodically.
3. To monitor the program's progress, simple measuring tools, such as recording the amount of waste managed each week, can be used.

Low Parental and Community Involvement

1. Constraints: Parental and community involvement in supporting the project is often minimal, which can affect the program's success.
2. Solution: Involve parents in outreach and meetings regarding the importance of waste management.
3. Holding community events, such as "Environment Day," that invite parents and the community to participate in clean-up activities and waste sorting at school.

Limited Resources and Budget

1. Constraints: A limited budget can hinder the implementation of activities and the provision of facilities needed for the project.
2. Solution: Seek additional funding sources from local sponsors or government agencies that care about the environment.
3. Educating students to innovate by using recycled materials in handicraft activities, thereby reducing the need for new materials.

In the implementation of 3R-based waste management project management at SMP Fikri Jakarta, various obstacles can arise that can hinder the success of the project. However, with the right strategy and cooperation between students, teachers, parents, and the community, these obstacles can be overcome. Through continuous education and involvement of all parties, this project can achieve its goal of creating a cleaner and more sustainable environment.

4. Discussion and Benefits

Project Results Analysis

Project Management Implementation

This project focuses on learning methods where students are actively involved in solving real problems, in this case, waste management. Application of Project Management: Shows that students will be taught the concepts of project management to organize and implement waste management projects. The comparison unequivocally demonstrates that the 3R program's implementation, aided by project management, has improved student conduct and the school environment. Although there has been progress, especially in the areas of environmental awareness and student involvement, sustainability calls for constant facility upgrades, stakeholder commitment, and monitoring. Enhancing these elements will increase the program's long-term advantages. By applying the principles of reduce, reuse, and recycle to reduce waste in the school environment. The problems in each problem formulation are as follows:

Performance Evaluation of 3R-Based Waste Management Program

The 3R management program at SMP Fikri Jakarta has shown significant progress despite still facing various obstacles. Integrating the 3R concept into the curriculum has been one important step in helping students understand the importance of comprehensive waste management. Facilities such as separate trash bins and regular campaign implementation are key components in raising awareness among students and school staff. Although not perfect, this program has succeeded in creating a foundation for more effective and sustainable waste management.

The performance of the 3R management program at SMP Fikri Jakarta is quite good as an initial step in building environmental awareness in schools. By integrating the 3R concept into the curriculum and involving students in waste management activities, the school has created a strong foundation for the sustainability of this program. However, its implementation still needs to be strengthened, especially in terms of providing facilities and stricter supervision so that the program's objectives are achieved optimally.

This program has been implemented well in terms of planning and initial implementation steps. Integration of the 3R concept into the curriculum, routine campaigns, and student involvement show positive progress. However, its implementation is still not optimal because it still faces obstacles such as inadequate facilities and the need for further supervision to ensure the active participation of all school residents.

Environmental Awareness Among Students and School Staff

Students' awareness of waste management varies. Some students have begun to understand the importance of sorting waste and supporting the 3R program, but others are still less involved due to the lack of interesting education and practical examples in schools. Regular campaigns and training have helped to encourage a change in some students' mindsets, but the sustainability of the program is needed to reach awareness evenly throughout the school community.

Students' awareness of the importance of waste management at SMP Fikri Jakarta is quite varied. Some students already understand and are active in the topic, but others are less exposed to interesting education. Campaigns and creative activities such as recycling workshops need to be increased and evenly distributed throughout the school community so that every student has a sense of responsibility for the environment.

Students and school staff's awareness of the importance of waste management has begun to increase, but it is not yet evenly distributed. The education provided has succeeded in attracting the attention of some students, but many still do not understand due to the approach that is not fully interesting and the lack of practical examples in the school environment. This means that awareness has been built but has not been fully achieved at all levels of the school community.

4 Challenges and Obstacles in Implementing the 3R program

The program faces major challenges, such as the lack of adequate facilities, including separate waste bins and recycling equipment. Resistance to changing habits, both from students and staff,

is also a barrier to implementation. Budget constraints reduce the school's ability to provide additional facilities and support optimal program implementation. In addition, low involvement of parents and external communities reduces support that could strengthen the program's sustainability. The lack of regular monitoring and evaluation also makes it difficult to measure program results objectively.

The main challenges faced are the lack of facilities such as separate waste bins and recycling equipment, which are essential to support this program. Resistance to changing habits is also a significant obstacle because changing mindsets takes time and consistent effort. Budget constraints and a lack of involvement from parents and external communities also complicate the implementation of the program. This suggests the need for a more collaborative and creative approach to address these obstacles.

The main obstacles are challenges such as a lack of supporting facilities, resistance to changing habits, budget constraints, and low parental and community involvement. This shows that even though the program has been implemented, important aspects still need to be resolved to ensure maximum success.

Solutions and Strategies for Increasing Participation in Waste Management
To overcome these challenges, several solutions can be applied:

1. Interesting Education: Holding poster competitions, recycling workshops, and other interactive activities to increase students' interest in the 3R program.
2. Procurement of Facilities: Raise funds or seek sponsorship to provide separate bins, recycling equipment and other supporting facilities.
3. Routine Socialization and Training: Conduct scheduled campaigns and training to ensure every student, teacher, and staff understands their role in the program.
5. Involving Parents and Communities: To expand the scope of impact, parents and local communities should be involved in waste management programs.
6. "Clean Day" Campaign: Holding regular school cleaning activities to increase a sense of collective responsibility.
7. Monitoring and Evaluation: Form a special team to periodically monitor program results, including measuring waste reduction and the success of educational activities.

The best solution is to create more interesting and interactive educational programs, such as recycling competitions or creative campaigns. Providing supporting facilities, such as separate trash bins, is also very important to support the success of the program. In addition, involving the community and parents can expand the impact of this program. With fundraising or cooperation with sponsors, schools can also overcome budget constraints. Regular campaigns such as "clean days" can be an effective way to instill new habits that support the sustainability of waste management in schools.

The solutions implemented include regular campaigns, integration into the curriculum, and initial provision of facilities, but they still need to be improved. Interactive educational programs, fundraising for additional facilities, and involvement of parents and external communities are steps that need to be prioritized to make the program more effective.

Obstacles and Solutions to Implementing ManagementProjects in Waste Management Based on 3 R (Reduce, Reuse, Recycle)
The 3R management program at SMP Fikri Jakarta faces challenges such as a lack of adequate facilities, resistance to changing habits, and budget constraints. However, steps such as integrating waste management education into the curriculum, providing facilities, and regular campaigns have shown progress. Students' awareness of the importance of waste management still varies due to the lack of interesting education and the lack of practical examples in schools. Other challenges include limited facilities such as separate trash bins, resistance to changing habits, lack of program monitoring, minimal involvement of parents and the community, and limited budget. To increase

awareness and participation, solutions that can be implemented include interesting educational activities such as poster competitions and recycling workshops, providing waste sorting facilities, regular socialization and training, involving the community and parents, seeking sponsorship or additional funds, and holding regular "clean day" campaigns. Collaboration between students, teachers, parents, and the community is essential to realizing effective and sustainable waste management.

School Waste Management
Waste management in schools is very important because it has a wide impact on the environment and student education.

Positive Impact of Waste Management in Schools:

1. Cleaner and Healthier Environment: By managing waste properly, schools create a cleaner and healthier learning environment. This will reduce the risk of waste-related diseases and improve air quality.
2. Educating an Environmentally Conscious Generation: Through waste management, students are taught about the importance of protecting the environment from an early age. They will be more aware of the impact of waste on the environment and motivated to contribute to environmental preservation.
3. Raising Recycling Awareness: Waste management in schools is a great opportunity to teach students about the concept of recycling. They will learn that waste is not just waste but also a valuable resource if managed properly.
4. Cultivating Responsibility: By being involved in waste management, students will learn about environmental responsibility. They will understand that their actions, no matter how small, can have a big impact.
5. Creating a More Sustainable School: Schools that implement good waste management are real examples of sustainable schools. This will inspire other schools to follow in their footsteps.

The Relationship between Waste Management and Education
Waste management in schools is not only limited to cleaning activities but is also an integral part of the educational process. Through waste management, students can:

1. Learning Science Concepts: Students can learn about the processes of decomposition, recycling, and the impact of waste on the ecosystem.
2. Developing Practical Skills: Students can learn to sort waste, make compost, and recycle different types of materials.
3. Improving Critical Thinking Skills: Students are invited to analyze waste problems, find solutions, and evaluate the results.
4. Building Character: Students learn about cooperation, responsibility, and social awareness.

Examples of Waste Management Activities in Schools

1. Waste Sorting: Dividing waste into organic and non-organic.
2. Composting: Processing organic waste into compost.
3. Recycling: Converting non-organic waste into new products.
4. Environmental Campaign: Holding socialization activities about the importance of protecting the environment.
5. Adopt a Trash Program: Each class or group of students is responsible for the cleanliness of a certain area of the school.

Thus, waste management in schools is not only a cleaning task but also an investment in a better future. Schools play an important role in forming a young generation that cares about the environment and is aware of how to protect the earth.

Implications for the Field of Management
The implementation of waste management in schools includes various strategies and approaches that can be implemented to create a clean and sustainable environment. Here are some important aspects of the implementation:

Waste Management Policy

1. Policy Making: Schools need to establish clear policies regarding waste management, including goals, responsibilities, and management procedures.
2. Internal Regulations: regulates the types of waste that may be brought to school and the procedures for its disposal.

Education and training

1. Environmental Education Program: Conducting workshops and seminars for students and staff on the importance of waste management and recycling techniques.
2. Training Staff: Provide teachers and staff with training on how to educate students and manage waste effectively.

Procurement of Waste Management Facilities

1. Separate Trash Bins: To facilitate management, provide separate trash bins for organic, inorganic, and recyclable materials.
2. Recycling Area: Set up a dedicated area for collecting recyclable materials that can be processed or donated.

Practical Activities

1. Recycling Program: Establish a recycling program at school, including the collection of plastic bottles, paper, and other items.
2. Clean-up Activities: Organizing clean-up activities in the school environment to increase awareness and cleanliness.

Collaboration with External Parties

1. Partnerships with NGOs: Work with environmentally focused NGOs to gain support and resources.
2. Collaboration with the Government: Participating in government programs related to waste and environmental management.

Monitoring and Evaluation

1. Performance Measurement: Describes the system for displaying and highlighting the effectiveness of the implemented waste management program.
2. Student and Staff Input: Students and staff work together on waste management programs for continuous improvement.

Use of Technology

1. Waste Management Application: Utilizing applications to educate students about waste management and facilitate activity reporting.
2. Information Systems: Using information systems to record and report the amount of waste managed and recycled.

Implementing waste management in schools requires a holistic and integrated approach. By involving all elements of the school, from students and staff to external parties, waste management can be more effective and sustainable. This not only creates a clean environment but also educates the younger generation to be more environmentally conscious.

Project Results

Based on the data collected through learning methods between students and teachers about waste management with the 3R concept. The results of the implementation of waste processing in general can be seen from the following components, which include:

Project Objective Achievement

The project objective is to develop effective solutions to increase awareness and participation of all school members in waste management. Through the implementation of the 3R program, SMP

Fikri Jakarta has succeeded in significantly increasing the participation of students, teachers and school staff in the Clean Friday activity held on January 10, 2025, which can be seen on SMP Fikri Jakarta's social media. (Instagram, SMP Fikri). A high level of participation also has an impact on reducing the level of waste at SMP Fikri Jakarta, besides also forming student creativity in utilizing inorganic waste and recycling it into more useful items.

Achievement of Material Targets
The planned materials include understanding reduce, reuse, recycle and waste management in the school environment. The materials are delivered in detail so that they affect students' acceptance of them. In addition to the materials, all students at SMP Fikri Jakarta are also involved in planning and managing projects that form skills.

Waste management efforts have also succeeded in increasing student creativity by applying the concept of recycling or recycling waste. It can be seen that in SMP Fikri has the most types of waste processing, namely cardboard, paper and plastic bottle caps. Waste processing and its results are carried out in several ways that can be utilized based on their types, including utilization of recycled plastic, utilization of recycled paper, making crafts from cardboard, used bottle caps, and so on.

Project Improvement Evaluation
Evaluation of 3R-based waste management projects (Reduce, Reuse, Recycle) at SMP Fikri Jakarta focuses on analyzing the success of implementation, challenges faced, and opportunities for future improvement. This includes data collection using project initiation, project planning, project implementation, project monitoring and control, project closing, and direct observation of project implementation.

Success Achieved
1. Waste Volume Reduction:
    a. According to weekly reports, the waste volume has significantly reduced by up to 40% compared to before the project started.
    b. Organic waste is successfully processed into compost which is used for school gardens.
2. Increasing Environmental Awareness:
    a. The level of student and staff participation in sorting waste has increased, as seen from active involvement in sorting and environmental education activities.
    b. Educational campaigns through school social media also reached hundreds of students and parents.
3. Implementation of Innovation: Recycled products, such as handicrafts made from used plastic, are one form of student creativity that is appreciated.

Challenges Faced
a. Sustained Awareness: After the project phase ended, there was an indication of a decline in students' awareness levels regarding the importance of waste sorting.
b. Infrastructure Limitations: The number of separate waste bins is still insufficient to support full-scale implementation of the 3R program.
c. Parental Involvement: Parental support in encouraging similar behavior at home is still limited.

5. Conclusion
The following are the conclusions drawn from the 3R-based waste management project at SMP Fikri Jakarta in the form of points:
The 3R-based waste management program at SMP Fikri Jakarta has shown positive developments with integration into the curriculum, regular campaigns, and student involvement. However, to achieve more optimal effectiveness, improvements are still needed in the provision of facilities, stricter supervision, and active participation of all school residents. By strengthening these aspects, this program has the potential to become a more sustainable and impactful waste management system.

Environmental awareness among students and staff of SMP Fikri Jakarta has begun to increase but is not evenly distributed. Education and campaigns have helped build understanding, but a more engaging and interactive approach is needed to reach the entire school community. By increasing creativity in education and providing more practical examples, student awareness and involvement in waste management can be more evenly distributed and sustainable.

The implementation of the 3R program at SMP Fikri Jakarta still faces various challenges, such as limited facilities, resistance to changing habits, a limited budget, and minimal involvement of parents and the community. Lack of monitoring and evaluation is also an obstacle to measuring the program's effectiveness. Therefore, a more collaborative, innovative, and sustainable approach is needed to overcome these obstacles so that the program can run more optimally and provide a wider impact.

Increasing participation in waste management at SMP Fikri Jakarta can be done through more interesting education, provision of adequate facilities, and regular socialization and training. In addition, parental and community involvement, the "Clean Day" campaign, and periodic monitoring and evaluation are needed to ensure the effectiveness and sustainability of the program. With a more creative and collaborative approach, the 3R program can run more optimally and provide a wider impact in building environmental awareness in schools.

Recommendations

To enhance the effectiveness of the 3R-based waste management program at SMP Fikri Jakarta, several specific improvements are recommended. First, it is important to establish a "Green School Committee" consisting of students and teachers to monitor and evaluate the continuous implementation of the 3R principles. This committee would serve as a driving force in fostering a culture of environmental responsibility within the school. Second, there should be a significant improvement in waste management facilities, including increasing the number of separate trash bins throughout the school area and providing additional composting facilities to process organic waste more efficiently. Third, the school is encouraged to initiate collaborative efforts with the community, particularly by organizing family education programs that involve parents in supporting 3R practices at home.

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