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## IMPROVING ECOLITERACY BASED ON LOCAL WISDOM IN THE ADIIWIYATA PROGRAM AT ELEMENTARY SCHOOLS IN BANDUNG CITY

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### ABSTRACT

*Environmental problems in schools, one of which is waste management, is still a challenge due to the lack of student awareness in applying local wisdom-based ecoliteracy. This study aims to examine the increase in students' ecoliteracy awareness through the implementation of a zero-waste school program in the Adiiwiyata Program at the elementary school level. The method applied in this research is descriptive qualitative using observation techniques and field notes of 29 4th grade students in one of the public elementary schools in Bandung City. Data were collected through observation sheets covering aspects of ecoliteracy understanding, habit of bringing lunch without plastic, and participation in environmental activities. The results showed that 100% of students had brought lunch in reusable containers, 93.10% bought snacks without plastic packaging, and 82.76% understood the importance of protecting the environment. However, participation in environmental campaigns is still low at 51.72%, and the utilization of used materials is only 34.48%. In conclusion, this program is effective in improving students' ecoliteracy, but it still requires strengthening discipline and parental support to make behavior change more sustainable.*

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## 1. INTRODUCTION

As social beings, humans must care about various issues in their environment. However, in reality, humans also act as consumers and producers. Ironically, excessive exploitation of nature actually damages the ecosystem. Humans tend to damage the environment more in order to meet their needs than to preserve and develop the natural environment (Pingge et al., 2024). The same applies to students in schools, where they are taught to care for the environment through the learning process. The goal is for the understanding they gain to have a positive impact on their own lives, families, communities, and nation (Trianto & Heryani, 2021). Humans are influenced by the environment in which they live, while also playing a role in shaping that environment. If we pay attention, humans who do not consider the impact of their actions are a major factor in the destruction of nature.

Therefore, instilling awareness of environmental sustainability needs to be done early on in schools through the creation of a culture that cares for and is friendly to the environment, so that a sense of responsibility for the environment can be fostered and students can learn to appreciate having and maintaining the environment. The environment is a space that is home to various living things and consists of various components, both biotic and abiotic. These components include animals, plants, water, air, soil, climate, minerals, and other elements that are collectively known as natural resources.

This explanation is supported by several opinions from experts who emphasize that the environment, consisting of interconnected biotic and abiotic components, creates ecosystem balance (Supriatna, 2016), stating that the environment is everything that exists in the quantity and condition that we inhabit and influences life in a space. The opinion (Elfrida et al., 2023) states that the environment is important in providing all the necessities of life, which is one of the important things in the learning environment. Cleanliness in the learning environment can support order and comfort during the teaching and learning process. Therefore, it is important to maintain balance in the relationship between humans and nature, as both are inseparable components and each component in the environment influences the balance, stability, and productivity of the ecosystem. Harmonious interaction between biotic and abiotic elements will maintain environmental sustainability, while disruption to one component can affect the entire system.

Currently, there are many environmental problems occurring, and the main contributing factors are human activities that are not environmentally friendly, such as excessive exploitation of natural resources, air and water pollution, deforestation, and waste production that is not properly managed by humans. The high intensity of human interaction with nature has resulted in increasingly severe environmental damage. Uncontrolled human activities, such as excessive exploitation of natural resources and improper waste management, cause ecosystem imbalances and reduce the quality of the environment.

Rapid population growth has led to many environmental problems, and one of the main contributing factors is human activities that are not environmentally friendly. Along with technological developments and improved living standards, the demand for natural resources has increased, which can ultimately lead to overexploitation and damage to the balance of ecosystems (Wisman & Santoso, 2024). Environmental damage can be caused by a lack of attention to ecological understanding among individuals or the majority of society. Unawareness of the importance of maintaining ecosystem balance often leads to excessive exploitation of nature, pollution, and the use of natural resources without considering the long-term impacts (Normalita et al., 2022).

Human activities tend to pay less attention to environmental sustainability and focus more on the excessive exploitation of natural resources without considering the negative impacts. This can lead to various environmental problems, such as pollution, deforestation, and a reduction in ecosystem balance. In line with the opinion (Wardatussa & Suntari, 2024) which states that environmental awareness is an important aspect in dealing with global issues related to natural destruction and plays a role in supporting sustainable development efforts. One of the environmental issues that is currently being felt is pollution, whether it be air, water, or soil pollution, which has a direct impact on human health and ecosystem balance. In the school environment, the issue of waste is also becoming a serious concern, given that suboptimal management can trigger negative impacts on the cleanliness and health of the school community.

Improper waste management can cause environmental pollution, such as air pollution from burning waste, water pollution from waste contaminating rivers and oceans, and soil pollution that disrupts the balance of the ecosystem. If ignored, this will have a negative impact on the health of living creatures and environmental sustainability, reduce air quality, and create an uncomfortable learning environment. Additionally, the awareness of students and educators regarding the importance of proper waste management still needs to be improved. Schools play an important role in shaping the character and positive habits of students, such as routines or habits that should be simple and planned in advance (Heryani & Trianto, 2023), including in terms of caring for the environment. Therefore, programs are needed that can instill a culture of clean and environmentally friendly living from an early age.

The School, Zero Waste Program is presented as one solution to address waste issues in the school environment. Waste that is not managed properly can cause various problems, such as environmental pollution, the spread of disease, and disruption to the ecosystem. Therefore, proper waste management is very important to prevent negative impacts that can disrupt human life and the balance of nature (Febriyanti et al., 2023). This program aims to create a waste-free school environment, because schools not only play a role in producing intelligent generations, but also in shaping cultured Indonesians. Through this program, students are taught to be aware and responsible in maintaining cleanliness and environmental sustainability as part of a sustainable lifestyle (Kurniawan et al., 2023).

This program is implemented through various activities, such as waste sorting, recycling, reuse, and waste reduction. With this program, it is hoped that all school members can increase their awareness and responsibility in maintaining cleanliness and environmental sustainability. Educators play an important role in helping students understand that humans and the environment are closely connected. Every human action that affects the environment will have an impact on humans themselves. Therefore, all forms of kindness or damage done to the environment will have consequences for human life in the future.

## **2. METHODS**

### **1. Research Approach and Method**

This study applied a qualitative descriptive approach. The qualitative descriptive method is used to examine an object in its natural state, where the researcher acts as the main instrument in the research process. Data collection was carried out using triangulation techniques, while data analysis was inductive. The results of this study focus more on understanding the deeper meaning rather than just producing generalizations (Damayanti et al., 2023). The descriptive approach is a method used to describe an object as it is in the field,

in accordance with the actual conditions that occur without any engineering or manipulation (Normalita et al., 2022).

Data was collected through observation and field notes. The research subjects included students involved in the Adiwiyata Program in elementary schools. This research was conducted by a teacher with the help of an observer in collecting information related to learning practices. The purpose of this research was to improve and enhance the quality of learning. Research is a systematic process that includes data collection, analysis, and interpretation to improve human understanding of phenomena that attract attention or cause concern.

In this context, it has been proven that humans often apply a systematic approach when collecting and interpreting information to solve problems in everyday life (Rizky Fadilla & Ayu Wulandari, 2023). This study will be conducted in three meetings, with each meeting allocated 2 × 35 minutes. This time allocation is determined and adjusted based on the class schedule set by the school.

## 2. Research Subjects.

This research was conducted at a public elementary school in Bandung during the even semester. The research subjects were the main focus in the collection of data and information. In this study, the subjects selected were 29 fourth-grade students, consisting of 15 female students and 14 male students.

## 3. Data collection techniques

This study applied qualitative descriptive analysis techniques, which are included in qualitative data analysis. The data findings are presented in the form of descriptions using words to provide a more in-depth picture. In this study, the analysis guidelines used were:

### a. Observation

During the observation stage, teachers and observers observe student activities during learning and use student activity observation sheets. Classroom observation serves to document the impact of actions taken and the processes that occur during learning (Nusantara & Nurgiansah, 2023). Evaluation is carried out using observation sheets that record student activities during the activity. The purpose of this evaluation is to identify the extent of student participation and involvement in the learning process.

### b. Field notes

In the field notes results in this study, data analysis was carried out to complement and strengthen the data obtained regarding the influence of ecoliteracy in solving environmental problems (Nurfadilah & Afriansyah, 2022). The findings were compiled based on student activities recorded in the field notes. Furthermore, each finding from these activities was explained and described in sentences to form a summary that served to complement the observation data.

## 4. Data Analysis

Data analysis was performed using interactive analysis techniques, which included three main stages, namely data reduction, data presentation, and conclusion drawing.

## 3. RESULTS AND DISCUSSION

### 3.1 Results

This study was conducted on fourth-grade students at a public elementary school in Bandung with a total of 29 participants. The purpose of this study was to analyze the increase in ecoliteracy based on local wisdom through the implementation of the Zero Waste School

Program. In this program, students are expected to bring their own lunch boxes and buy snacks in reusable containers, rather than disposable ones. The results of the study were obtained through observation and field notes. The following are the results of observations of student behavior in implementing the program:

No.	Success Indicators	Number of Students	Yes	No
1	Students are able to explain the impact of waste on the environment and the importance of reducing plastic use	29 Students	82%	18%
2	Students always bring their own meals without plastic packaging	29 Students	100%	0%
3	Students buy snacks using their own containers or without plastic	29 Students	93%	7%
4	Students actively participate in environmental education activities and discussions on ecoliteracy	29 Students	52%	48%
5	Students are responsible for the waste they produce	29 Students	69%	31%
6	Students are able to create or reuse items from recycled materials	29 Students	34%	66%
7	Students regularly participate in school environmental clean-up activities	29 Students	100%	0%

### 3.2 Discussion

#### 1. Observation Results

The results of observations of student habits in implementing the zero waste school program are presented in Table 1 below:

From the observation results, the aspects with the highest success rates were bringing lunch in reusable containers (100%) and participating in school clean-up activities (100%). Conversely, the aspects with the lowest level of involvement were the use of recycled materials (34.48%) and participation in environmental campaigns (51.72%), indicating that student awareness in these aspects still needs to be improved.

#### 2. Field Notes

In addition to the observation results, field notes provide an in-depth description of student behavior and factors that influence the success of the zero waste school program:

a. Student behavior: In general, student behavior was as expected, although some students were still adapting to the new habits.

b. Student response to the program: Initially, students felt a little forced to implement this program, but over time the habit began to form.

c. Obstacles encountered: One of the main obstacles is the lack of support from parents in implementing waste-free habits at home.

d. The role of teachers and schools: Teachers play an important role in guiding students and reminding them to implement waste-free habits in their daily lives. Through continuous guidance, students can become more aware of the importance of protecting the environment and consistently practicing environmentally friendly behaviors.

e. Suggestions and recommendations: This program will be more effective if it is supported by high discipline and strict enforcement of rules. Thus, students can remain consistent in practicing zero waste habits and building sustainable environmental awareness.

Based on the results of the study, it appears that the application of ecoliteracy based on local wisdom in waste-free school programs has shown positive results. Although there are

still several challenges, the environmental problems that occur today are clear evidence of a lack of understanding about the environment or low levels of ecoliteracy. Therefore, it is necessary to make continuous efforts to increase students' awareness and understanding of the importance of protecting the environment through educational programs at school (Maulana et al., 2021). Students' environmental awareness has increased, as seen from the observation results that 82.76% of students understand the importance of maintaining a waste-free school environment. This shows that the program has succeeded in increasing students' awareness of the importance of caring for the environment. Preserving and conserving the environment is a human responsibility, which includes harmonious social interaction with nature. If environmentally conscious behavior continues to be practiced, it will shape a character that reflects a sustainable concern for the environment.

With the development of an environmentally conscious character, individuals will become accustomed to caring for and preserving the environment on an ongoing basis. This habit will encourage more responsible actions towards nature, so that the balance of the ecosystem can be maintained (Nurhayati & Langlang Handayani, 2020). Although there are still around 17.24% who do not fully understand the importance of ecoliteracy, the role of teachers as educators is very important in motivating students to increase their sensitivity to the environment. Through continuous guidance and education, students can become more aware of the importance of protecting the environment and applying environmentally conscious habits in their daily lives (Mihratun et al., 2022).

In terms of behavioral change, 100% of students now bring their lunch in reusable containers, while 93.10% of students buy snacks without single-use plastic packaging. This proves that the program has successfully encouraged students to reduce their use of single-use plastics. However, 31.03% of students are still not consistent in bringing home their personal trash, indicating that this habit still needs to be reinforced with additional supervision and practice because, fundamentally, the steps to start realizing a healthy school include several main components, one of which is school policy. This policy includes regulations governing school environmental cleanliness and health, educational programs on health and the environment for students, and proper and environmentally friendly waste management. In addition, the provision of adequate sanitation facilities and the implementation of a healthy lifestyle culture in the school environment are also important factors.

With clear and consistently implemented policies, schools can create a healthy, comfortable environment that supports optimal student growth and development by implementing school policies that are environmentally conscious and culturally sensitive. This includes developing a health and environment-based curriculum, implementing participatory activities that involve the entire school community, and managing and developing adequate facilities and infrastructure to create a healthy and sustainable learning environment (Tria Vilian & Minsih, 2021).

Despite progress in the implementation of ecoliteracy, several obstacles remain, particularly a lack of support from parents. Some students still find it difficult to apply these habits at home because their parents do not fully support the habit of bringing their own lunch boxes or reducing the use of plastic. This fact is in line with the opinion (Mulyanti et al., 2025) that students who do not bring healthy meals do so because their parents are too busy to prepare healthy meals for their children. Due to their busy schedules, some children are given meals without considering their nutritional content.

For parents, one of their roles is to prepare meals for their children who go to school, which is certainly an inseparable daily routine. In addition, participation in environmental campaigns and the use of recycled materials is still low, with only 51.72% of students actively participating in socialization and 34.48% of students utilizing recycled materials. This activity shows that there is a need for innovation in learning, such as the integration of local wisdom. By integrating local wisdom values into learning,

learning becomes more effective than conventional learning. This is because the material is related to the students' daily lives, making it easier for them to understand, appreciate, and apply the knowledge in their daily lives. On the other hand, this approach also helps preserve culture and build awareness of the importance of protecting the environment and social values in their community, especially when children are directly involved in all activities from the beginning of their understanding of knowledge, skills, and practices, which start with careful planning by educators and are then translated into project modules that are easy for children to understand. These modules are designed to suit the developmental stages of children, so that educators can guide them more effectively.

With this approach, students not only understand concepts in theory, but are also able to apply them in real life through more meaningful learning experiences, as well as additional motivation to make students more interested in environmental activities (Ali et al., 2022). In the context of ecoliteracy learning, behaviorism theory states that human behavior can be shaped through reinforcement and repeated habits. In this case, the habit of zero waste that is continuously practiced in schools can create students who care about their environment.

Through this habit, students will become more aware of the importance of maintaining environmental cleanliness and sustainability and will feel responsible for managing waste properly. With continuous practice, environmental awareness will not only be implemented in the school environment but also in wider life, thereby shaping a generation that is aware of the importance of protecting the environment. This is in line with the opinion of (Muyassaroh et al., 2024) that local wisdom embedded in students' lives is a valuable form of direct experience. Therefore, integrating local wisdom into learning can help students understand concepts in a contextual manner.

By linking learning materials to values and practices that are familiar in their lives, students find it easier to connect theory with everyday reality. This learning method not only improves understanding but also fosters a sense of care and responsibility for the environment and surrounding culture. In addition, according to Piaget's constructivism theory, direct experience in maintaining environmental cleanliness can improve students' understanding of the importance of ecoliteracy. Teachers play a crucial role in the success of this program, especially in setting an example and continuously reminding students of the importance of ecoliteracy.

Through their attitudes and actions, teachers can serve as role models for students in adopting environmentally conscious habits. Furthermore, ongoing guidance from teachers will help students understand that ecoliteracy is not just a theory, but must also be applied in daily life to preserve the environment. The success of this program also depends heavily on school regulations. Schools need to establish stricter rules regarding the implementation of waste-free habits and conduct regular evaluations to assess the program's effectiveness. Strengthening discipline, involving parents, and innovating ecoliteracy learning are important factors in the sustainability of this program.

Thus, the implementation of ecoliteracy based on local wisdom through the zero waste school program has had a positive impact on changing student behavior. However, for this

program to be more effective and sustainable, support from various parties, including teachers, schools, and parents, as well as innovation in ecoliteracy learning methods, is needed.

## 5. CONCLUSION

The results of this study indicate that the implementation of ecoliteracy based on local wisdom in the zero waste school program in elementary schools has succeeded in increasing students' awareness and behavior in protecting the environment. From the observation results, it was found that 100% of students brought lunch in reusable containers, 93.10% of students bought snacks without plastic, and 82.76% understood the importance of keeping the school environment free of waste. However, there are still several aspects that need improvement, such as participation in environmental campaigns (51.72%) and the use of recycled materials (34.48%). The main supporting factor for the success of this program is the role of teachers in guiding students, while the obstacles faced include a lack of support from parents in instilling environmentally friendly habits at home.

The implications of this study indicate that ecoliteracy education in elementary schools can be an effective approach in building environmental awareness from an early age. By instilling waste-free behavior and reinforcing the concept of local wisdom in the Adiwiyata program, students not only understand the importance of protecting the environment but also apply it in their daily lives. Furthermore, the results of this study are in line with behaviorism theory, which states that behavioral change can be shaped through habits and continuous reinforcement. Therefore, the zero-waste school program can be used as a model for other schools in implementing sustainable ecoliteracy-based education.

## Recommendations

Based on the findings of this study, it is recommended that schools strengthen regulations related to the zero-waste school program, such as implementing stricter rules on the use of single-use plastics and increasing awareness among parents to better support waste-free habits at home. In addition, innovation is needed in environmental campaign activities to make them more attractive and increase student participation, for example through creative projects based on the use of recycled materials or environmental-themed competitions. Regular program evaluations are also necessary to identify obstacles and design more effective strategies for building a sustainable ecoliteracy culture in elementary schools.

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