

Integration of Environmental Literacy in IPAS Learning to Enhance the Ecological Awareness of Fifth Grade Students at MI Darul Ulum 02 Kudus

Wafiq Azizah^{1*}, Laisya Syifana Hariyanto Putri², Eva Luthfi Fakhru Ahsani³

¹⁻³Institut Agama Islam Negeri Kudus, Indonesia

*Corresponding email: wafiq798@gmail.com

Article Info	Abstract
Received: 17-12-2024 Revised: 19-02-2025 Accepted: 19-02-2025 Published: 22-02-2025 Keywords: Environmental Literacy; IPAS Learning; Ecological Awareness	The low awareness of environmental literacy has led many individuals to perceive environmental issues as trivial. In fact, environmental literacy plays a crucial role in human survival, particularly in fostering responsible ecological awareness. Therefore, implementing environmental literacy from an early age is an urgent necessity to ensure that students develop a strong understanding of the importance of maintaining environmental balance. This study aims to analyze the integration of environmental literacy in IPAS (Natural and Social Sciences) learning to enhance the ecological awareness of fifth-grade students at MI Darul Ulum 02 Kudus. The research method used is a quantitative approach. The results of this classroom action research indicate that integrating environmental literacy into IPAS learning can improve students' ecological awareness, as evidenced by positive outcomes. The percentage of students achieving different levels of success is as follows: 53.33% of students received an excellent rating, 26.67% received a good rating, and only 20% received a sufficient rating. These percentages demonstrate that conducting classroom action research in two cycles has had a positive impact on improving students' understanding of environmental literacy and their ecological awareness in the fifth grade of MI Darul Ulum 02 Kudus.

Info Artikel	Abstrak
Kata Kunci: Literasi Lingkungan; Pembelajaran IPAS; Kesadaran Ekologis.	Kesadaran yang rendah terhadap literasi lingkungan menyebabkan banyak individu menganggap isu lingkungan sebagai hal yang sepele. Padahal, literasi lingkungan memiliki peran krusial dalam kelangsungan hidup manusia, terutama dalam menumbuhkan kesadaran ekologis yang bertanggung jawab. Oleh karena itu, penerapan literasi lingkungan sejak dini menjadi kebutuhan mendesak untuk memastikan bahwa siswa memiliki pemahaman yang kuat tentang pentingnya menjaga keseimbangan lingkungan. Penelitian ini bertujuan untuk menganalisis integrasi literasi lingkungan dalam pembelajaran IPAS (Ilmu Pengetahuan Alam dan Sosial) guna meningkatkan kesadaran ekologis siswa kelas V di MI Darul Ulum 02 Kudus. Metode penelitian yang digunakan adalah pendekatan kuantitatif. Hasil penelitian tindakan kelas ini menunjukkan bahwa integrasi literasi lingkungan dalam pembelajaran IPAS dapat meningkatkan kesadaran ekologis siswa, sebagaimana dibuktikan oleh

hasil yang positif. Persentase siswa yang mencapai berbagai tingkat keberhasilan adalah sebagai berikut: 53,33% siswa memperoleh predikat sangat baik, 26,67% memperoleh predikat baik, dan hanya 20% yang memperoleh predikat cukup. Persentase ini menunjukkan bahwa pelaksanaan penelitian tindakan kelas dalam dua siklus telah memberikan dampak positif terhadap peningkatan pemahaman siswa mengenai literasi lingkungan serta kesadaran ekologis mereka di kelas V MI Darul Ulum 02 Kudus.



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INTRODUCTION

Environmental issues have become one of the important global concerns in recent times. One of the environmental issues that is widely discussed is the issue of environmental damage and global warming (Syahadat, 2022). This damage is not only caused by natural changes but also significantly influenced by human activities, which play a major role in environmental degradation and global warming. One example of an environmental issue that frequently occurs in Indonesia is waste. According to data from the National Waste Management Information System (SIPSN), in 2023, the amount of waste reached 20,537,727.95 tons per year, or 56,267.75 tons per day (Mahardika, 2024). From this data, it is clear that awareness about waste management is very important, starting with simple actions like separating organic, inorganic, and hazardous waste. In addition to waste problems, another cause of global warming is air pollution, which leads to a decline in air quality. Based on the Air Quality Index (AQI) data, air pollution in Indonesia is currently detected at 155 AQI US, with the main pollutant being PM 2.5 (Rahardjo, 2024). This has caused the air quality in Indonesia to worsen. The lack of environmental awareness among individuals results in continued environmental problems without the perpetrators realizing their impact. Solutions to various environmental issues must come from all disciplines, with the most fundamental being the education sector (Aini et al., 2020). One effort to reduce this is by decreasing the sources of air pollution, such as large factories that release air emissions without proper procedures, as well as reducing vehicle emissions. Additionally, planting green plants in the surrounding environment can help reduce pollution. This can happen because green plants can absorb carbon dioxide and release oxygen, thereby reducing air pollution.

In recent decades, educational programmers' attention to the phenomenon of environmental destruction has increased. Schools/Madrassas, as places for learning and educating students, should be used as platforms to instill and spread the culture of environmental conservation. The United Nations Conference on the Human Environment held in Stockholm, Sweden, in 1971 was a serious effort to address humanity's concern for the environment. Subsequently, in October 1977, the Tbilisi Conference on Environmental Education was held, organized by UNESCO (United Nations Educational, Scientific and Cultural Organization) in cooperation with UNEP (United Nations Environment Programme). The declaration following the Belgrade Charter outlined a more comprehensive document on the goals, objectives, roles, characteristics, framework, and guidelines of environmental education. Teaching about the environment should train individuals to be aware of the environment and their responsibilities in conserving it (Suhirman, 2020).

Environmental issues not only focus on their development but also recognize that the foundation for solving environmental problems lies in knowledge and education about the environment. An engaging environmental education model for children will certainly help them better appreciate and understand the lessons. Enjoyable learning experiences are what every child desires. The learning experiences of children in today's education are very important. Students gain experience through contextual environmental education. Pleasant learning experiences also provide strong support for student learning. In formal education, learning experiences are crucial, influenced by various environmental factors, social dynamics, and institutional structures (Purnami, 2020).

From the explanation of environmental issues above, awareness of environmental care or ecological awareness is crucial to instill from an early age, through environmental literacy. Environmental literacy is the ability of an individual to understand and interpret environmental conditions (Yulianti, 2021). Environmental literacy can be taught in the smallest spheres such as the family, school, and community. At the elementary school (SD) or Madrasah Ibtidaiyah (MI) level, environmental literacy is very suitable to be taught through integration in learning. Environmental literacy includes five aspects in environmental education: knowledge, awareness, attitude, skills, and participation. If all five aspects are present in students, then these students can be said to have understood environmental literacy and possess ecological awareness (Idris, 2022).

Ecoliteracy aims to cultivate individuals who are aware of the importance of preserving nature and the environment. Through ecoliteracy, individuals are encouraged to think and act to protect and care for the Earth, ecosystems, and nature as a place for life to thrive. Awareness of the environment, or ecological literacy, is essential to fostering a harmonious relationship between humans and nature. One of the channels for promoting ecoliteracy is through educational institutions such as schools. Schools are educational institutions that aim not only to provide knowledge to students but also to shape critical thinking, teach skills, and instill noble values in students. Schools serve as effective platforms for instilling ecoliteracy in students, developed through curricula, policies, facilities, infrastructure, and budgets based on environmental conservation. To implement environmental literacy/ecoliteracy for students, several steps can be taken: (1) Instilling the concept of ecoliteracy in students through lessons about the environment and nature. (2) Organizing programs that involve students in environmental preservation activities. (3) Conducting regular evaluations of the learning process and ecoliteracy activities to provide recommendations for improving ecoliteracy goals in schools (Nuri et al., 2023).

In the context of environmental literacy, literacy refers to an individual's ability to understand, apply, and participate in complex environmental issues. It involves comprehension of environmental concepts and principles, as well as the ability to interpret scientific information related to environmental problems. Environmental literacy is essential for fostering awareness and sustainable actions in preserving and protecting the environment. Environmental literacy, particularly in developing an attitude of environmental care, according to educational experts, takes years to instill in a child's personality (Habibi et al., 2024). Enhancing students' environmental literacy through learning processes sharpens and heightens sensitivity and concern for the Earth's flora and fauna, fosters significant attention to environmental safety, encourages the wise use of resources to prevent extinction, and promotes awareness of global environmental issues. All these efforts contribute to the creation of sustainable development, which emphasizes technological and economic progress while prioritizing the preservation of natural and social environmental interests.

In the previous study titled *The Influence of the Discovery Learning Model Assisted by Interactive Multimedia on Environmental Literacy in IPAS Learning for Fifth Grade Students in Cluster XI of Bengkulu City*, published in a journal by (Wulandari et al., 2024), the focus was on the Discovery Learning Model and Interactive Multimedia in the implementation of IPAS learning related to environmental literacy. The difference between that study and the current research is that while the previous study emphasized the use of Discovery Learning and Interactive Multimedia, the current research focuses on tangible evidence of environmental literacy implementation integrated with IPAS learning. This allows students to directly practice what they have learned.

The difference between the current research and the second previous study, titled *Improving Environmental Literacy of Children Aged 5-6 Years Through the Eco-Enzyme Project* by (Herawati et al., 2021) lies in their approach to enhancing environmental literacy. The previous study focused on improving environmental literacy through the implementation of the eco-enzyme project, which involved habituating children to dispose of waste properly and process it into eco-enzyme. However, this approach primarily concentrated on waste management issues. In contrast, the current research enhances environmental literacy by introducing waste classification, encouraging proper waste disposal habits, and utilizing surrounding land for greening efforts with beneficial plants. Thus, this research not only addresses waste management but also emphasizes environmental restoration through natural reforestation.

The research conducted by (Mawardi et al., 2023) as published in the journal titled *Development of an Environmental Literacy Module through School Programs in Elementary Schools*, examines the improvement of students' environmental literacy using teaching modules as the primary learning material. The findings indicate that the use of modules can enhance students' understanding of environmental issues, although their involvement in real-world practices remains limited. The main difference between this study and previous research lies in the teaching method employed. While previous studies relied solely on teaching modules, this research integrates both theory and practice as a learning strategy. This approach is expected to have a greater impact on raising students' awareness and engagement in environmental conservation efforts.

A preliminary study conducted through interviews with the IPAS (Integrated Science) teacher of Grade V at MI Darul Ulum 02 Kudus revealed that ecological awareness and environmental literacy are very low. This situation arises due to the lack of knowledge among the school community about environmental literacy. During the learning process, no teacher has integrated knowledge about environmental literacy, which has led to students' limited understanding of environmental literacy and ecological awareness. This lack of awareness has resulted in many fifth-grade students still disposing of waste improperly. Additionally, the school has yet to establish specific activities to foster environmental care as part of its routine practices.

The fact that many students fail to dispose of waste properly, coupled with low ecological awareness and a lack of environmental sensitivity, highlights the need for action. Integrating environmental literacy into IPAS (Integrated Science) lessons is a crucial step to building environmental literacy and enhancing ecological awareness. This effort aims to create a generation that cares for the environment, ensuring the sustainability of human life. Preserving the environment is both a duty and a responsibility for everyone, especially for students in schools or madrasahs. Every individual must take serious and earnest actions to protect the surrounding environment according to their own abilities and capacities.

RESEARCH METHOD

This research was conducted at MI Darul Ulum 02 Kudus. The population in this study consisted of fifth-grade students at MI Darul Ulum 02 Kudus. The sample in this study included 30 fifth-grade students from MI Darul Ulum 02 Kudus. This research employed a quantitative research method with a descriptive research design. This approach aligns with the research objective of identifying and analyzing the integration of environmental literacy in IPAS learning to enhance students' ecological awareness.

In the research on integrating environmental literacy into the IPAS (Integrated Science) lessons for Grade V at MI Darul Ulum 02, several stages were undertaken. Problem identification: This initial step involved identifying and understanding the issues being investigated by the researcher. Literature review in this stage, the researcher studied and understood theories that served as guidelines. These were obtained from books, journals, and online resources.

The third stage was data collection, which employed several methods Interviews, this method was used to identify issues related to environmental literacy in the fifth-grade class at MI Darul Ulum 02 Kudus. Observations, observations were conducted to examine the school's environmental conditions and the characteristics of the students.

The fourth stage involved conducting Classroom Action Research (CAR) to integrate environmental literacy into IPAS (Integrated Science) lessons. This was complemented by the use of tests as a data collection method. The test method involved providing a set of questions related to environmental literacy for students to answer. The fifth stage was report preparation, where findings from the research were compiled into a formal report (Santoso, 2021).

This study utilized two data sources, primary data sources, these were obtained from the fifth-grade homeroom teacher and the fifth-grade students of MI Darul Ulum 02 Kudus. secondary data sources these included scientific journals and other relevant reference materials. The data were collected through structured interviews, observation sheets, and Classroom Action Research (CAR) conducted in two cycles (Irawan, 2021).

The sampling technique used in this study was purposive sampling. This technique involves selecting specific subjects or groups deemed relevant to the research, or in other words, choosing samples based on certain considerations. It is a method for obtaining samples by selecting informants who are considered to have the most understanding of the research problem, ensuring that the chosen informants meet criteria that support the research data (Sugiyono, 2018). In this study, the sample consisted of fifth-grade students from MI Darul Ulum 02 Kudus. This choice was made because the IPAS (Integrated Science) material being taught is related to the environment, making the integration of environmental literacy particularly appropriate for these students.

RESULTS AND DISCUSSION

Implementation of Classroom Action Research on Environmental Literacy in Fifth-Grade Students at MI Darul Ulum 02

The environmental literacy approach is a learning model designed to develop and implement environmental literacy programs, focusing on fostering environmental knowledge and awareness. The strength of this learning model lies in its ability to provide students with hands-on experiences and encourage participation in real-world actions. Through this method, students can learn in a more holistic and practical way, helping them

to deeply understand environmental issues and apply this knowledge in their daily lives. They are involved in practical activities, such as environmental projects, field research, or participation in conservation efforts. This approach offers profound experiences and enables students to connect concepts with real-world contexts.

The environmental literacy model emphasizes active participation by learners in efforts to protect and preserve the environment. In this context, they are encouraged to engage in various environmental activities, such as tree planting. Through this approach, learners not only understand environmental concepts but also make tangible contributions to environmental conservation practices in their daily lives (Mawarni, 2024).

To achieve optimal results in this program, careful planning was required, including coordination with research partners. External coordination with MI Darul Ulum 02 was conducted to determine the participants, location, and timing of the implementation. Once the schedule was agreed upon, the implementation of the environmental literacy integration program to increase students' ecological awareness was carried out, as outlined in this report. Integration itself is the process of combining various elements or components into a harmonious whole. The integration of environmental literacy into IPAS (Integrated Science) lessons was conducted to enhance ecological awareness, especially among students at MI Darul Ulum 02 Kudus. This research was conducted over two meetings, organized into two cycles. A more detailed discussion of the research results for each cycle is as follows:

Cycle 1

In the planning stage, the researcher selected the topic of environmental issues and waste classification as the subject matter to be developed. The selection was based on the view that these topics are significant issues related to the environmental phenomena present in the surrounding area. This activity was planned to consist of one meeting, focusing on the various stages of the activity, from introducing the topic to designing and taking action. During this planning process, the researcher prepared a Teaching Module (Lesson Plan) and the activity instruments, using the Project-Based Learning (PBL) model. PBL is an instructional model that emphasizes problem-solving, requiring critical thinking skills to address the issues at hand (Muliana, 2024). The teaching methods employed included discussion, question-and-answer sessions, demonstrations, and lectures.

Implementation stage - cycle 1, in the first meeting, the session began with the delivery of material related to environmental issues and waste classification. The researcher also

posed thought-provoking questions such as, "Have you ever seen someone throw garbage carelessly? What happens if garbage is thrown inappropriately?" Following this, the students were divided into groups. Each group was given a Student Worksheet (LKPD) to be discussed among the group members. The LKPD contained a problem related to the environmental issues that had been covered. After the discussion session, the researcher swapped the LKPDs between groups for a joint discussion. To assess each group's participation, the researcher had previously provided name tags for each student to help with the evaluation process. It was observed that some group members did not contribute much during the group activity.

In the LKPD worksheet, there are three sections of questions: one that asks students to determine whether human activities are right or wrong for the environment, a story problem related to the environment, and a matching section for waste types (organic, inorganic, and hazardous waste). Based on the LKPD results, out of 30 students, 17 students did not understand environmental literacy, while 13 students did. Below is a pie chart presenting the percentage of students' understanding of environmental literacy.

Percentage Level of Understanding of Environmental Literacy Cycle 1

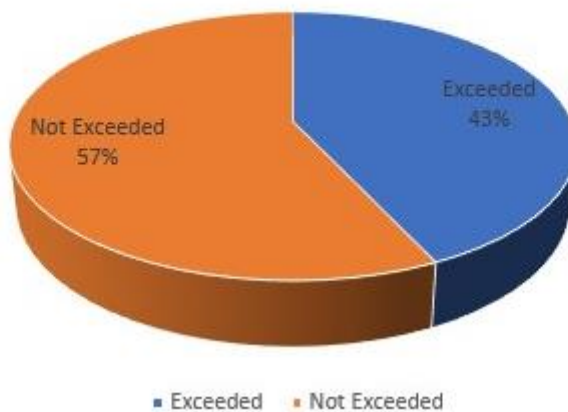


Figure 1. Percentage of Ecological Awareness of Fifth-Grade Students at MI Darul Ulum 02 Cycle 1

From the diagram above, it can be seen that in Cycle 1, most students still had a limited understanding of environmental literacy in theory. It can be concluded that the level of ecological awareness of fifth-grade students at MI Darul Ulum 02 is still low. During the implementation process, the researcher found that the main challenge in Cycle 1 was that many students were not paying attention to the lesson material. This resulted in students

having difficulty understanding the material. Therefore, as an improvement measure in the next cycle, the researcher will manage the class by applying teaching methods suited to the students' active nature and kinesthetic learning style to achieve the learning objectives.

Cycle 2

In the planning stage, the researcher prepared the learning topic to be covered, beginning with the delivery of material related to the impact of environmental problems. The selection was based on the view that this topic is closely related to the phenomena occurring in the surrounding environment. The activity started with a thought-provoking question such as, "Have you ever seen vehicle smoke? What happens if vehicle emissions are allowed to continue unchecked?"

In this cycle, the focus was on solutions or activities to prevent environmental damage, particularly concerning air pollution. Air pollution has negative effects on human health, such as causing irritation to the respiratory system, leading to coughing, colds, and throat irritation. Long-term exposure can result in chronic lung diseases such as chronic bronchitis, emphysema, and even increase the risk of lung cancer. Cardiovascular and circulatory issues: Air pollution can affect the cardiovascular system. Small airborne pollutants can enter the bloodstream and cause inflammation in blood vessels, increasing the risk of coronary heart disease, heart attacks, and strokes. Long-term exposure to air pollution can also lead to high blood pressure and damage to blood vessel function. Immune system disorders: Air pollution can affect the immune system, making the body more susceptible to respiratory infections such as pneumonia, bronchitis, and sinus infections. Allergy and asthma problems: Exposure to allergens in air pollution, such as pollen, pet dander, and dust mites, can trigger allergic reactions and asthma attacks in vulnerable individuals. Air pollution can also worsen pre-existing asthma symptoms (Hidayat, 2023).

The solution offered in this activity was the planting of green plants. Green plants were chosen as a solution because they offer numerous benefits, including: Reducing carbon dioxide (CO₂) through the process of photosynthesis (Rizal, 2020). Enhancing ecological value, improving the environment by contributing to biodiversity. Increasing aesthetic value, as green plants enhance the beauty of the surroundings. Supplying oxygen, which is essential for life and helps improve air quality (Amin, 2024).

In the implementation activity, the students continued with group work since groups had already been assigned in the previous meeting. In this session, students proceeded

directly to their respective groups. The researcher explained and provided instructions on how to plant green plants (Brazilian spinach), including the steps involved and the necessary tools and materials. Prior to this, the students had already been informed about the benefits of the plants they were about to plant and care for.

Brazilian spinach, or *Alternanthera sissoo*, is a low-growing vegetable plant with green leaves that are round and wrinkled. This plant can thrive in tropical and subtropical regions and can grow in both shaded areas and full sunlight. It is highly tolerant of soil pH, waterlogging, and is very easy to cultivate. Besides being easy to plant in home gardens and producing good oxygen, Brazilian spinach has several health benefits due to its phytochemical content, including: Beta-carotene, xanthene, lutein, and vitamin A help maintain eye health. Minerals, vitamins, and flavonoids present in the plant help prevent the growth of cancer cells. Magnesium promotes bone growth and strength and plays a role in stabilizing blood pressure. High vitamin A content helps the body prevent infections and inflammation. Folic acid helps prevent cardiovascular diseases and the hardening of blood vessels. Iron content aids in red blood cell regeneration, preventing anemia. Consuming Brazilian spinach regularly as part of a balanced diet can help strengthen the immune system, prevent stroke, normalize blood pressure, prevent cancer and osteoporosis, and maintain eye health (Budiarso, 2022).

Next, after forming groups, the students discussed and organized their project plans and problem-solving strategies, including task distribution and preparation of the required tools and materials. The activity continued with each group planting Brazilian spinach, following the schedule and procedures they had previously agreed upon. The researcher observed the planting process carried out by each group and monitored the students' engagement and teamwork during the practice. Once the planting was completed, the researcher asked the students to explain the procedure for planting Brazilian spinach and its benefits for the surrounding environment. Other groups listened to the presentation. The researcher assessed the planting results from each group. The evaluation indicators included knowledge, skills, and attitudes in understanding environmental literacy (Muftakhim, 2021).

After the planting process, the researcher reinforced the understanding of how well the students comprehended ecological awareness. The researcher created a game in which the students were given cards containing two categories of waste: organic and inorganic. The researcher distributed the cards one by one and asked the students to place them into

boxes labeled for organic and inorganic waste. Based on the results, the researcher found that six students still did not understand the difference between organic and inorganic waste. At the end of the lesson, the researcher reviewed the material that had been presented and studied. The students were enthusiastic and still remembered the material. It is hoped that after this lesson, students will become more caring and sympathetic toward the environment. Through this learning activity, students not only gain a basic understanding of ecological concepts but also develop the ability to contribute to environmental preservation.

The Impact of Classroom Action Research on Environmental Literacy on Students Ecological Awareness

From the results of the Classroom Action Research (CAR) through two cycles, the percentage of environmental literacy and ecological awareness in the fifth-grade students of MI Darul Ulum 02 improved and reached a good outcome. This percentage was obtained from the processed data of the observation sheets. Below is a presentation of the percentage results of the CAR regarding the environmental literacy of the fifth-grade students at MI Darul Ulum 02:

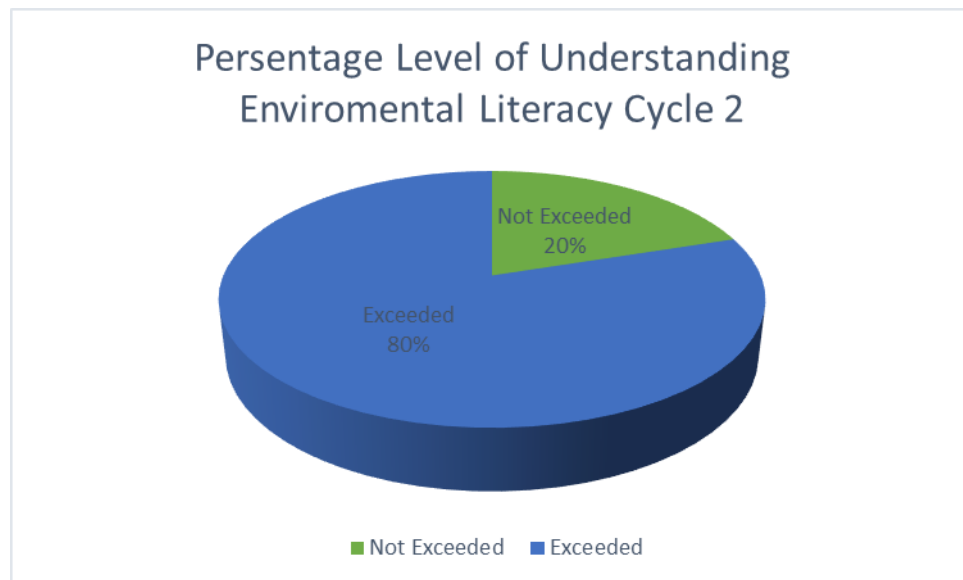


Figure 2. Percentage of Ecological Awareness of Fifth-Grade Students at MI Darul Ulum 02 Cycle 2

From the percentage chart above, it can be observed that in Cycle 2, there was a significant improvement in the ecological awareness of Grade V students at MI Darul

Ulum 02. It is evident that hands-on practice helps students better understand the learning objectives that were previously taught through theoretical explanations.

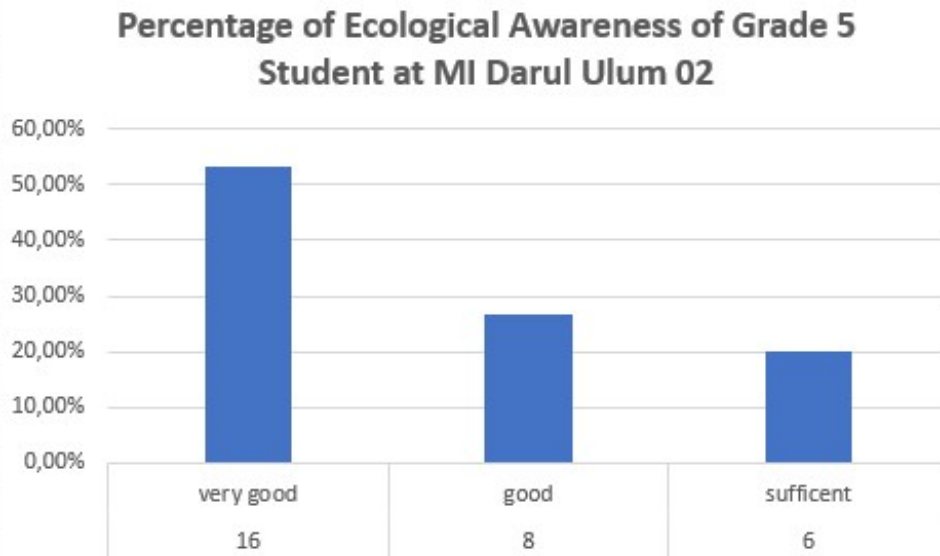


Figure 3. Percentage Chart of Ecological Awareness of Grade 5 Student at MI Darul Ulum 02

From the percentage chart above, it can be explained that out of 30 fifth-grade students at MI Darul Ulum 02, 16 students reached the "very good" category, which is 53.33% of the total number of students. Eight students fell into the "good" category, accounting for 26.67%, and six students were in the "sufficient" category, representing 20%. It can be concluded that after conducting the Classroom Action Research (CAR) based on environmental integration in IPAS (Science and Social Studies) lessons, there was an improvement in the ecological awareness of the fifth-grade students at MI Darul Ulum 02.

The research results show that providing an understanding of ecology and practicing plant cultivation can foster empathy toward nature among students, broaden their awareness of human dependence on ecosystems, and encourage proactive actions to protect the environment. Building students' ecological awareness is crucial because it can make them more sensitive to environmental changes and more concerned about the environment.

Maintaining and preserving green environments is crucial for sustaining the balance of nature and the well-being of humanity. Protecting green environments is a long-term investment in the sustainability of life on this planet. The critical reason why raising awareness about the importance of caring for green environments in Indonesia is essential lies not only in the well-being of the present but also for the future generations to come.

Environmental literacy is very beneficial for humans as it fosters awareness to live in harmony with nature. Efforts to improve environmental literacy can be carried out within the school environment, where the synergy between teachers and students can lead to ecological awareness. So far, environmental literacy has not been viewed as something extremely important in schools. As a result, schools often serve only as a space for transferring scientific knowledge, neglecting environmental conservation. Through this community service activity, environmental literacy in schools can be improved, even though it is still in its early stages. With environmental literacy, school members, both teachers and students, are encouraged not only to take care of their school environment but also the broader environment where they live and exist. The key point of this environmental literacy is how teachers and students can live in harmony with nature and the environment, thus minimizing the risks of disasters and environmental degradation.

CONCLUSION

From the above explanation, it can be concluded that the integration of environmental literacy into the IPAS learning process at MI Darul Ulum 02 has had a positive and quite satisfactory impact. This can be seen from the percentage of students' ecological awareness based on assessment indicators, which include aspects of knowledge, skills, and attitudes in understanding environmental literacy. Environmental literacy is crucial to be applied and instilled from an early age to create a generation that cares about the environment for the sustainability of human life. With environmental literacy, school members, both teachers and students, are not only encouraged to care for their school environment but also for the broader environment in which they live. The key point of this environmental literacy is how teachers and students can live in harmony with nature and the environment, thus minimizing the risks of disasters and environmental damage.

ACKNOWLEDGMENTS

We would like to express our sincere gratitude to the Principal of MI Darul Ulum 02, Mrs. Noor Munanjah, S.Pd., for granting us permission and the opportunity to

conduct classroom action research at MI Darul Ulum 02. Our heartfelt thanks also go to Mr. Riyanto, S.Pd., the fifth-grade homeroom teacher, for taking the time and allowing us to share some material with the fifth-grade students. We truly appreciate the opportunity given to us for this research.

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