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Analysis of Strengthening Environmental Literacy in Science Learning at MI GUPPI Jladri Buayan Kebumen

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Abstract: This study aims to analyze the strengthening of environmental literacy in science learning at the GUPPI Jladri Buayan Elementary School in Kebumen. This study used a qualitative approach with a phenomenological approach. Data collection techniques included interviews, observation, and documentation. Data were analyzed using the interactive analysis model of Miles, Huberman, and Saldana, which includes three stages: data condensation, data presentation, and conclusion drawing or verification. The results indicate that environmental literacy-based science learning can strengthen students' understanding and awareness of the importance of environmental protection. However, obstacles remain in the process of strengthening environmental literacy, including limited plastic waste processing facilities within the school environment.

Keywords: Environmental literacy, science learning, Islamic elementary school.

Introduction

Education plays an important role in shaping students' character and awareness of the environment. Amidst climate change and challenges, access to and quality of education for students in coastal areas remains an important issue. One of the efforts that can be made to strengthen student awareness is through environmental literacy. Environmental literacy is the ability to understand how to maintain environmental balance and take concrete actions to preserve the environment. This literacy is not just about reading or understanding environmental information, but also includes the ability to make wise decisions.

Natural sciences (IPA) is one of the subjects in MI that has great potential in developing students' environmental literacy skills. Through this subject, students not only understand concepts, but are also guided to apply this knowledge in their daily lives, namely by maintaining cleanliness and environmental sustainability. Therefore, science learning can be a strategic means of shaping scientific attitudes and concern for the environment.

However, strengthening environmental literacy in Madrasah Ibtidaiyah still faces various obstacles. Some of these include limited infrastructure, a lack of environment-based learning media, and a lack of activities that directly involve students in environmental issues. This can affect and hinder students' understanding of environmental literacy.

Based on this background, this study aims to determine how to strengthen environmental literacy through science learning at MI GUPPI Jladri Buayan Kebumen. This study is expected to provide an overview of the implementation of environmental literacy-based learning, as well as the factors that support and hinder students' awareness of environmental protection.

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Method

This study uses a qualitative approach with a phenomenological type with the aim of exploring teachers' experiences and views on science learning processes oriented towards environmental literacy. This study was conducted at MI GUPPI Jladri Buayan Kebumen because this school has implemented science learning related to environmental themes. The participants in this study were science teachers who had more than 10 years of teaching experience. Data was obtained by asking reflective questions through interviews to confirm, verify, and experience the teachers' responses, as well as observing and documenting the implementation of science learning oriented towards environmental literacy. The technical analysis of the research data used the interactive analysis model of Miles, Huberman, and Saldana (2014), which consists of three main stages. First, data condensation, which is the process of selecting, focusing, and simplifying data from the field. Second, data presentation, which is compiling data into a narrative or matrix form to facilitate drawing conclusions. Third, drawing conclusions and verification, which is interpreting the overall meaning of the data to find patterns and research findings.

Results And Discussion

Results

Science teachers' strategies for strengthening environmental literacy

Environmental literacy education should be instilled from an early age, especially in formal education settings. This integration will be adapted to the applicable curriculum. The curriculum is an important component in the education system that contains a description of the mission and objectives of a nation's education (Sd, 2018). One of the functions of the curriculum is to serve as a guideline for achieving national education goals, namely to shape the character of students who care about the environment.

The results of the study show that science teachers at MI GUPPI Jladri Buayan Kebumen implement learning that is oriented towards strengthening environmental literacy through activity-based contextual strategies. Teachers integrate learning activities with students' direct experiences of the environment around the school, such as observing plants, water, and organic and inorganic waste. This strategy is in line with the Read-Answer-Discuss-Explain-Create (RADEC) learning model, which emphasizes critical thinking and knowledge construction through active interaction between students and the learning environment (Nurpratiwi et al., 2023). By implementing a model that encourages active student involvement, science learning not only fosters scientific understanding but also shapes students' awareness and concern for environmental issues around them.

Teachers also utilize the school's surrounding environment as a primary learning resource in science education. For example, activities such as observing plants, insects, or rainwater are used as learning materials that are directly linked to scientific concepts such as ecosystems, the water cycle, and energy. This strategy reflects the application of environment-based science learning that focuses on the connection between science and the real-life context of students. Cahyani and Djudin (2024) explain that environment-based learning can develop scientific thinking skills while instilling values of caring for the environment from an early age. Through this approach, students learn not only to understand concepts but also to practice scientific attitudes and responsibility towards the environment.

Source: Research Documentation

Figure 1. Science teachers collaborating with the Indonesian Red Cross (PMI).

In addition, strategies to strengthen environmental literacy are also carried out through collaboration between schools, parents, and the community. Science teachers work with institutions such as the Indonesian Red Cross (PMI) and environmental agencies to carry out learning activities related to disaster preparedness and waste management. Interviews with teachers show that this form of partnership helps enrich students' learning experiences and strengthen social awareness values. Teachers stated, *"We try to encourage students to learn directly from external institutions such as the PMI so that they can see firsthand how to protect the environment and respond to disasters."*. This is in line with the findings of Saputri et al. (2024), which emphasize that collaboration between schools, parents, and the community is very important in shaping children's character, including environmental awareness.

Source: Research Documentation
Figure 2. Weekly community service activities.

Science teachers also apply habituation methods to foster environmentally conscious behavior in students. Habituation practices at school include sorting waste according to type, performing routine community service every week, and maintaining classroom cleanliness. Observations show that these habituation practices have become part of the school culture and are carried out consistently. Gantini and Fauzati (2021) emphasize that the habituation approach in the behaviorist perspective is effective in instilling positive character in students, because behaviors that are repeated can form lasting habits. Thus, simple activities such as sorting waste or cleaning the environment become a tangible form of implementing sustainable environmental literacy.

Source: Research Documentation
Figure 3. Cleaning the beach in the school area as an outdoor learning activity.

Teachers also utilize outdoor activities as a strategy to strengthen students' environmental literacy. Outdoor activities, such as groundwater observation, vegetable planting, and beach clean-ups in the school area, provide meaningful hands-on learning experiences for students. Based on the interview results, teachers said, *"When learning outside the classroom, children are more enthusiastic; they can immediately see and understand the relationship between science lessons and the surrounding environment."*. This is in line with Pipo et al. (2023), which shows that outdoor learning can increase students' activity and motivation in science subjects.

In addition, teachers use concrete media such as ice, water, and steam in teaching about changes in the form of objects. These concrete media help students understand abstract science concepts while fostering curiosity about natural phenomena around them. Junitasari et al. (2024) emphasize that concrete media have a positive effect on science learning outcomes because they provide meaningful direct experiences. Through this strategy, teachers not only improve cognitive understanding but also connect learning to real-world contexts close to students' lives.

Teachers apply the guided inquiry learning model to foster students' scientific thinking skills and motivation to learn. In this activity, students are encouraged to ask questions, make observations, and draw conclusions from their observations of the school environment. For

example, students investigate the relationship between environmental cleanliness and the health of plants or small animals around the school grounds. This inquiry model encourages students to actively discover knowledge and understand science concepts in depth. This learning model is in line with the research by Wahida et al. (2022), which states that the guided inquiry learning model can increase students' motivation and science learning outcomes.

Source: Research documentation

Figure 4. Community cooperation in reforestation activities in coastal areas.

The school is also involved in reforestation activities in coastal areas, involving several students in mangrove planting. This activity provides real-life experience about the importance of maintaining coastal ecosystem balance and nature conservation. Through these activities, students understand the ecological function of mangroves in preventing abrasion, maintaining air quality, and preserving marine and terrestrial ecosystems.

Based on observations and interviews, the strategies implemented by science teachers at MI GUPPI Jladri Buayan Kebumen have had a positive impact on increasing students' knowledge and awareness of the environment. Students demonstrated behaviors such as disposing of trash properly, maintaining school cleanliness, and participating in social environmental activities. These results align with the research by Miterianifa and Mawarni (2024), which confirms that the environmental literacy learning model effectively enhances students' ecological awareness and knowledge.

The challenge for science teachers in strengthening environmental literacy

Although various strategies have been implemented to strengthen students' environmental literacy, science teachers at MI GUPPI Jladri Buayan Kebumen still face a number of obstacles in their implementation. The main obstacle lies in the lack of awareness among some students in maintaining environmental cleanliness. Teachers revealed that *"children actually know the importance of maintaining cleanliness, but sometimes they still forget or are not used to doing it without being reminded."*. This shows that environmental-based character education needs to be carried out systematically in order to foster independent ecological awareness. Retno Handayani et al. (2024) stated that caring for the environment is not a natural talent, but the result of a continuous educational process.

The next challenge is the lack of active participation in environmental conservation activities. Even though teachers have set examples and instilled habits, student involvement still depends on external encouragement. This factor is in line with the findings of Rita Istiana et al. (2018), which explain that low student participation can be caused by a lack of internal motivation and social environmental support.

Limited resources and infrastructure are also often significant obstacles. Teachers said that the lack of facilities such as waste management sites and educational parks limits the implementation of environmental activities. Teachers said, "We try to use the school's surroundings as a learning medium because special facilities such as educational parks are not yet available. These limitations demonstrate the need for government and community support in providing facilities to support environmental literacy activities in madrasahs.

In addition to limited facilities, challenges also arise from the aspect of teacher competence in integrating environmental issues into science learning. This is because not all teachers have a background in science education or experience in designing environment-based activities. According to Utami et al. (2025), many school teachers still have difficulty understanding and teaching science

concepts contextually, especially in the implementation of the independent curriculum, which requires project-based learning and real exploration.

In addition, the lack of continuous monitoring and evaluation by schools and the community is also an obstacle. Although activities such as community service and disaster preparedness schools are already in place, continuous evaluation is not yet optimal. This is in line with the research by Ahyar et al. (2025), which emphasizes that the success of environmental character education is highly dependent on the continuity of activities and collaboration between parties.

Discussion

The results of this study show that science education plays a strategic role in shaping students' environmental awareness and concern. Teachers' strategies that link science concepts to real-world environmental contexts demonstrate that science education not only serves to transfer knowledge but also instills values and attitudes of environmental concern. This is in line with the research by Sawitri et al. (2024), which confirms that science education at the elementary level is effective in building students' environmental literacy and ecological responsibility.

Strengthening environmental literacy at MIP GUPPI Jladri Buayan Kebumen is also an effort to support the Sustainable Development Goals, particularly in the aspects of quality education and environmental sustainability. As explained by Yuliasih and Gunansyah (2025), environmental literacy in elementary schools plays an important role in fostering students' global awareness and social responsibility towards the environment.

In addition, the role of teachers as role models greatly influences the success of strengthening environmental literacy. Teachers' exemplary behavior in maintaining cleanliness and managing the school environment serves as a real example for students. Putra (2021) explains that teachers have a central role in shaping students' environmentally conscious character through habit formation and exemplary behavior.

The integration of environmental education into science learning also strengthens students' character and ecological responsibility. According to Nu'afifah (2022), environmental education integrated into the basic curriculum can foster students' ecological awareness and moral responsibility towards nature. Therefore, environmental literacy must be developed as an integration of science learning in madrasas.

Collaboration between parties is an important factor in the success of environmental literacy programs in schools. Activities such as community service, mangrove planting, and partnerships with external institutions demonstrate a form of community-based environmental education that broadens the impact of learning. Dinda et al. (2025) explain that collaboration between schools, communities, and parents in the Adiwiyata program plays a major role in creating an environmentally friendly school culture. By involving the surrounding community, values of caring for nature are not only learned but also practiced collectively in the students' social environment.

Overall, the results of this study reinforce the view that contextual and environment-based science learning can improve students' understanding and ecological awareness. The learning process that places the environment as a source of learning helps students relate scientific knowledge to the realities around them. This is in line with the research by Fa'izah et al. (2024), which confirms that the application of contextual learning is effective in improving learning outcomes and shaping students' scientific thinking skills. Thus, strengthening environmental literacy through science education at MI GUPPI Jladri Buayan Kebumen is a concrete effort to nurture a generation that is knowledgeable, has good character, and cares about environmental sustainability.

Conclusion

Based on the results of research and discussion, it can be concluded that strengthening environmental literacy at MI GUPPI Jladri Buayan

Kebumen has been optimally pursued through various contextual science learning strategies oriented towards students' direct experiences. Science teachers play an important role in integrating environmental values through observation activities, learning based on the surrounding environment, the use of concrete media, and the application of guided inquiry learning models. Activities such as community service, waste sorting habits, and mangrove planting practices are part of learning that not only improves scientific understanding but also fosters students' ecological awareness. In addition, partnerships with external institutions such as the Indonesian Red Cross and the environmental agency enrich students' learning experiences and strengthen collaboration between schools, communities, and parents. This collaboration contributes to shaping a school culture that cares about nature conservation and extends the impact of learning to the social sphere of students.

However, this study also found a number of challenges, such as limited supporting facilities and infrastructure, low participation of some students in maintaining environmental cleanliness, and the limited competence of teachers in systematically integrating environmental issues into science learning. Another challenge lies in the lack of ongoing support from schools and parents in monitoring and evaluating environmental literacy activities. Overall, the results of this study confirm that strengthening environmental literacy through science education is highly relevant to shaping an environmentally conscious character at the madrasah ibtidaiyah level. Sustainability efforts, teacher capacity building, and the provision of supporting facilities are important factors for environmental literacy programs to run more effectively and become part of the learning culture in Islamic elementary schools.

Conflict of Interest: The authors declare that there is no conflict of interest regarding the publication of this article.

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