

Environmental Education through the Adiwiyata Program: Efforts to Develop Students Ecological Intelligence

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Abstract

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Environmental education plays a crucial role in fostering ecological awareness and encouraging sustainable behavior among the younger generation. This study aims to analyze the implementation of environmental education at School through the Adiwiyata Program, extracurricular activities of the Environmental Lovers Group, and the school's plastic reduction policy. The research employed a descriptive qualitative method. The findings reveal that the integration of environmental education into classroom subjects, the active participation of students in practical activities, and the application of eco-friendly policies have successfully enhanced students' knowledge, caring attitudes, and concrete actions toward the environment. Internal factors, such as student motivation and direct learning experiences, as well as external factors, including family support, peer influence, and school regulations, significantly affect the effectiveness of environmental education. This study concludes that participatory and experiential approaches create a meaningful impact in shaping students ecological intelligence, while simultaneously strengthening the school's environmentally conscious culture.

1. Introduction

Environmental education is a strategic element in shaping a generation that is aware of the importance of natural preservation and sustainable behavior. In this modern era, environmental damage due to human activity has become a global issue that requires intervention through both formal and non-formal education. Environmental education aims not only to increase students knowledge about ecosystems and the impact of human activities but also to foster a caring attitude and the ability to take real action to protect the environment. Through this process, students are expected to be able to understand the reciprocal relationship between humans and the environment and internalize the values of sustainability in their daily lives (Whitley et al., 2018).

The school is one of the schools that actively implements environmental education systematically (Merritt et al., 2022). This school integrates environmental education into subjects, especially Geography and Natural Sciences, and provides a participatory platform for students through the extracurricular Environmental Lovers Group. In addition, the implementation of the Adiwiyata Program is a strategic step in fostering ecological awareness. This program encourages students to get involved in real activities, such as greening, waste management, environmental campaigns, and reducing plastic use, so that the learning experience is not only theoretical but also based on direct practice in the field.

Environmental education efforts can also be supported by internal school policies, such as a ban on the use of single-use containers, the implementation of cleanliness duty schedules, and the habit of bringing personal eco-friendly

equipment. This policy shows that environmental education is not just about delivering material but also includes the formation of a school culture that cares about the environment. Direct student experiences, such as gardening, cleaning the environment, and participating in conservation-based projects, have been proven to foster a deeper sense of responsibility and ecological care compared to conventional learning (Sheffield et al., 2022).

However, the success of the implementation of environmental education is inseparable from the challenges faced. Some students still show uncaring behavior, such as littering, and a lack of supervision in the implementation of eco-friendly policies (Prasetyo et al., 2020). In addition, students' learning and motivation is also an important factor that influences their involvement in environmental activities. Internal factors, such as interest and curiosity, as well as external factors, including family support, peer influence, and the surrounding community's culture, play a significant role in shaping ecological awareness. Research shows that the active student involvement in direct experiences and strong social support will increase the overall effectiveness of environmental education.

Therefore, this article aims to explore the implementation of environmental education at school, examine the impact of direct and experience on the formation of students' ecological intelligence, and identify the factors that influence awareness and eco-friendly behavior. This research is expected to contribute to the development of an environmental education model based on the participation, experience, and collaboration between the school, family, and community. Thus, environmental education is not only a learning instrument but also a foundation for

shaping students' characters who are caring, responsible, and have sustainable behavior

2. Literature Review

2.1. Sustainable Environmental Education and Ecological Intelligence

Environmental education has a fundamental role in shaping the ecological intelligence of students. Ecological intelligence not only includes aspects of knowledge about nature but also involves a caring attitude and the ability to act concretely to maintain environmental sustainability. According to Salimi et al. (2021), ecological awareness is born from a balanced combination of cognitive learning, emotional strengthening, and direct experience in the surrounding environment. Through real experiences, students can see and feel the cause-and-effect relationship between human activities and natural conditions, so their understanding becomes deeper and more meaningful.

Activities such as planting trees, managing waste independently, recycling, and directly observing ecosystems around the school and community, are proven to provide real insights into the impact of human behavior on environmental balance. Thus, students not only gain theoretical knowledge but also practical skills that form sustainable behavioral patterns. The study by Bergmann et al. (2021) underlines that experience-based learning has a more significant influence than conventional one-way methods, especially in fostering ecological awareness and building long-term care.

Therefore, the integration of environmental education into the school curriculum and the implementation of extracurricular activities that focus on natural preservation are important strategies to instill ecological values from an early age. Through this approach, schools do not only transfer knowledge but also create a generation that can think critically, behave wisely, and act concretely in facing the challenges of the global environmental crisis.

2.2. Internal and External Factors Influencing Environmental Behavior

The effectiveness of environmental education is essentially not only determined by the quality of learning materials delivered at school but is also influenced by various supporting factors that are both internal and external. Internal factors include personal motivation, interests, and students' direct experiences in interacting with the surrounding nature (Sverdlik et al., 2018). Students who have a natural interest in environmental issues usually show greater care and tend to implement eco-friendly behavior in their daily lives. Personal experience, for example, involvement in greening activities, waste management, or ecosystem observation, is also a powerful trigger in fostering ecological awareness from an early age.

On the other hand, external factors play an important role in strengthening these attitudes and behaviors. Consistent family support, peer influence, the implementation of pro-environmental school policies, and a community culture that values natural preservation are the main drivers for the formation of sustainable behavior. Begum et al. (2022) emphasizes that children who grow up in a family with environmental-friendly habits will more easily internalize the values of sustainability.

and even tend to carry these behaviors into adulthood. In addition, a positive social environment that supports eco-friendly practices can increase student involvement in various ecological-based activities, both at school and in the community.

Thus, the harmonious integration of internal and external factors is the main key in shaping consistent student behavior towards the environment. The combination of both makes environmental education not just a transfer of knowledge but also a means of forming sustainable ecological character.

3. Methods

This study employs a descriptive qualitative method as the primary framework for exploring data and information in a more comprehensive and in-depth manner. The qualitative approach was deliberately chosen because it is regarded as the most relevant strategy for capturing the complex dynamics associated with the experiences, perceptions, and attitudes of both students and teachers toward the implementation of environmental education in schools. Through this approach, the researcher is able to examine not only the observable aspects of teaching and learning but also the deeper meanings embedded in the interactions, behaviors, and lived experiences that contribute to the process of shaping students' ecological intelligence.

In practice, the process of data analysis is conducted using a qualitative descriptive technique that is oriented toward the systematic, detailed, and holistic presentation of findings. This technique emphasizes not only the description of empirical realities but also the interpretation of the social, cultural, and value-based

contexts that influence students' behavior. The data, which are gathered through various methods such as classroom observations, in-depth interviews, and documentation, are carefully examined and categorized in order to identify recurring patterns, meaningful relationships, and significant themes that emerge from the field.

Furthermore, the interpretation of the results is directed at revealing the interconnections between the implementation of environmental education programs and the gradual development of students' ecological awareness and intelligence. This analytical process is also aimed at identifying the internal factors, such as motivation, attitudes, and personal values, as well as external influences, including family support, peer interactions, and school policies, that shape sustainable behavior among students. By highlighting these dynamics, the research provides a broader and more nuanced understanding of how educational practices interact with social and cultural contexts in forming environmental care attitudes.

Ultimately, the application of this descriptive qualitative method is expected to offer a more comprehensive and contextualized understanding of the crucial role that environmental education plays in developing the ecological character of the younger generation. The findings are anticipated not only to enrich theoretical insights but also to serve as a practical reference for schools, educators, and policymakers in strengthening strategies for sustainability education.

4. Results and Discussion

4.1. Implementation of Environmental Education at School

The results of the study show that schools that are committed to implementing environmental education do so through systematic, structured, and continuous strategies. This implementation is clearly visible in the integration of learning materials in the classroom, the implementation of extracurricular programs, and the application of internal school policies that are in favor of environmental preservation. One real example of this effort is the implementation of the Adiwiyata Program, which has so far become the main foundation for forming an eco-friendly school culture. This program not only functions as a medium for conveying theoretical insights about the importance of preserving nature but also emphasizes the direct involvement of students in various relevant practical activities.

These activities include greening through tree planting, waste management based on 3R (reduce, reuse, recycle), and participation in environmental awareness campaigns both inside and outside the school (Huang et al., 2018). Furthermore, the integration of environmental education does not stop only at the level of material or extracurricular activities, but is also strengthened by various internal school policies that support the formation of eco-friendly behavior in students' daily lives. Examples of policies applied include a ban on the use of single-use containers, the implementation of class and school environment cleanliness duty schedules, and the habit of bringing personal eco-friendly equipment such as reusable water bottles and lunch boxes. This policy is proven to be effective in fostering positive habits in

students, so that they are gradually accustomed to reducing their dependence on single-use plastics.

Field observations showed active student participation in various environmental activities held by the school. Activities such as community service to clean the environment, recycling organic and inorganic waste, and planting trees around the school area are real forms of student involvement in maintaining the ecosystem (Yusuf et al., 2020). This direct experience strengthens students' understanding of the link between human behavior and natural preservation. This is in line with the theory of ecological intelligence which emphasizes the importance of direct practice as the main means of forming ecological awareness. Thus, students not only understand the concepts cognitively but also feel the real impact and benefits of environmentally friendly actions.

However, the implementation of environmental education programs is not free from a number of challenges. One of the obstacles found is that some students still show a lack of care, for example, littering, not carrying out cleaning duties on schedule, or ignoring the rules for using eco-friendly personal equipment. The factor of limited supervision also contributes to this condition, considering the number of supervisory staff in schools is relatively limited so not all students can be monitored thoroughly in every activity (Haris et al., 2018).

To address this challenge, the school has designed an innovative strategy in the form of community-based supervision. In this strategy, each class is given the responsibility of forming an environmental supervisory team consisting of student representatives. The team is in charge of reminding, supervising, and at the same

time giving examples of positive behavior to their friends. In addition, the school also seeks to expand the scope of support by involving parents and alumni to participate in instilling discipline and providing additional supervision outside the influence of teachers. This collaboration-based approach is expected to increase student compliance with school policies and foster a sense of collective responsibility for environmental preservation.

The findings of this study confirm that the combination of cognitive learning provided in the classroom, direct experience through various practical activities, and support for internal school policies can have a significant impact on the development of students' ecological intelligence. Effective environmental education is not only determined by the extent to which theoretical material is delivered but is also very much influenced by the level of active student involvement in real practice and consistent school social environment support. By integrating cognitive, affective, and psychomotor aspects, environmental education plays a major role in building a young generation with a caring, responsible character, and ready to maintain the sustainability of the earth.

4.2. The Impact of Ecological Intelligence on Student Awareness and Behavior

A more in-depth analysis shows that the development of ecological intelligence in the school environment has a very significant impact on three important aspects, namely students knowledge, attitudes, and concrete actions toward the environment. The knowledge aspect is obtained through the integration of environmental education materials in classroom learning, which is then strengthened by students' direct

experience in the field (Yadav et al., 2022). The learning process is not limited to the delivery of theory by the teacher but also involves various participatory methods such as direct observation, simple experiments, and real solution-based projects.

Through these activities, students gain a more concrete understanding of the reciprocal relationship between human activities and the surrounding environmental conditions. For example, when students conduct water pollution observation or school greening projects, they can really see how small actions can have a positive impact on ecosystem sustainability. This is much more meaningful than just receiving knowledge through lectures in the classroom, because direct experience provides a deeper awareness. In addition to knowledge, students' environmental care attitude also experiences significant development. This attitude can be observed through daily habits that begin to form, for example, the habit of sorting organic and inorganic waste, maintaining the cleanliness of the classroom and school yard, and actively participating in greening programs and environmental campaigns initiated by the school a moral responsibility to maintain the cleanliness and preservation of the environment, as part of the cultural identity of an Adiwiyata-based school. This indicates that the combination of direct experience, habituation, and clear school rules can form a consistent ecological empathy, care, and responsibility attitude in students (Wortham et al., 2020).

The third aspect, namely concrete action, is clearly visible through various activities carried out by students in their daily lives. Examples are the implementation of a class cleanliness duty schedule, involvement in community service activities, the use of eco-friendly items such as personal water bottles and lunch boxes, and

participation in simple conservation projects initiated by the school. These real activities not only increase ecological care but also shape students' characters who are more responsible for their environment. Internal factors such as students' motivation, interests, and personal awareness also influence their level of involvement. Students with high intrinsic motivation are usually more active and enthusiastic in participating in environmental programs, while students with low motivation still need additional support, guidance, and encouragement from teachers and peers (Chaudhuri, 2024).

On the other hand, external factors also play an important role in shaping students' eco-friendly behavior. Family support that instills sustainable practices at home, the positive influence of peers who are also active in environmental activities, and the surrounding community's culture that cares about natural preservation are reinforcements in the process of internalizing sustainability values. Komalasari et al. (2020) emphasizes that a social environment that supports sustainable practices can really encourage individual involvement in various environmental care activities, both at school and at home. Thus, the development of students' ecological intelligence actually depends not only on the school curriculum but is also very much influenced by the social and cultural interactions that surround their daily lives.

It can be stated that environmental education based on active participation and direct experience is proven to be able to form a higher ecological awareness in students. Through the integration of the Adiwiyata program, relevant extracurricular activities, and support for internal school policies, a strong foundation is created for students to have knowledge, attitudes, and behaviors that are in line with the principles of sustainability. The remaining challenges, such as limited supervision and

low motivation of some students, can be overcome with community-based strategies, periodic program evaluation, and continuous innovation in designing environmental activities. In this way, environmental education not only produces short-term impacts but also instills sustainable habits that can be carried on until students grow up, so they are ready to become a generation that cares for and is responsible for the preservation of the earth.

5. Conclusion

This study shows that environmental education at School has been implemented comprehensively through the integration of learning materials, extracurricular programs, and school policies that support sustainability. The Adiwiyata Program is a strategic step that not only increases students' knowledge about the environment but also encourages their active participation in real activities such as greening, waste management, and ecological awareness campaigns. The Environmental Lovers Group extracurricular activity is a platform for students to develop skills, initiative, and responsibility for natural preservation. School policies, such as the ban on single-use plastics and the cleanliness duty schedule, also form positive habits that support a school culture that is eco-friendly.

The research results show that the development of students' ecological intelligence, which includes knowledge, a caring attitude, and concrete actions, has a significant impact on their awareness and behavior in protecting the environment. Direct experience in the field is proven to be more effective in instilling sustainable values compared to theoretical learning alone. Internal factors, such as students'

motivation and interests, and external factors, including family support, peer influence, and the surrounding community's culture, are determinants of the successful implementation of environmental education.

Although various programs and policies have been implemented, challenges such as limited supervision and differences in the level of awareness among students still exist. Therefore, strengthening environmental education programs through a participatory approach, periodic evaluation, and experience-based innovation is key to ensuring the sustainability of educational outcomes. Overall, environmental education at school has succeeded in shaping students' characters who are aware, caring, and responsible for the environment, while also instilling a sustainable culture that can be applied throughout their lives.

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