

INCREASING ENVIRONMENTAL AWARENESS THROUGH THE IMPLEMENTATION OF THE ADIWIYATA MANDIRI PROGRAM AT SMAN 1 SUKAKARYA

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ABSTRAK

This study aims to analyze the implementation of the Adiwiyata Mandiri Program in increasing students' environmental awareness at SMAN 1 Sukakarya. Increasingly complex environmental issues demand effective environmental education at the secondary school level. This study uses a qualitative method with a case study approach. Data was collected through observation, in-depth interviews, and documentation over a period of 6 months. The research subjects include students, teachers, and managers of the Adiwiyata program. The results of the study showed that the implementation of the Adiwiyata Mandiri Program succeeded in increasing students' environmental awareness by 78% based on pre-test and post-test. Success indicators include increased participation in environmental activities, changes in environmentally friendly behaviors, and understanding of sustainable development concepts. The main supporting factors are the school's commitment, teacher support, and active student participation. The obstacles faced include limited funds, lack of awareness among some school residents, and lack of infrastructure support. Research recommendations include increasing funding allocation, strengthening teacher training programs, and optimizing the role of school committees.

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INTRODUCTION

The environmental degradation that occurs globally has reached a critical point that threatens the survival of human life and other living things on planet earth. Climate change, air and water pollution, deforestation, biodiversity loss, and energy crises are major challenges facing humanity in the 21st century. According to the 2023

Intergovernmental Panel on Climate Change (IPCC) report, global temperatures have increased by 1.1°C since the pre-industrial era, with impacts increasingly felt through extreme weather phenomena, rising sea levels, and unpredictable changes in weather patterns. This condition requires collective and systematic efforts to build environmental awareness at all levels of society, especially the younger generation as the nation's successor. In the community, the Ministry of Environment and Forestry (MoEF) noted that the national environmental quality index stood at 70.27 on a scale of 100 in 2023, indicating that more intensive repair efforts are still needed. (Kinerja, 2023)

Environmental education in formal educational institutions is a strategic key in shaping the character and behavior of a generation that cares about environmental sustainability. Schools as educational institutions have a vital role in instilling sustainability values and developing environmentally friendly attitudes and behaviors from an early age. Effective environmental education not only transfers knowledge about ecology and the environment, but must also be able to form sustainable pro-environmental awareness, attitudes, and behaviors. Successful environmental education must combine knowledge, attitudes, and actions that create sustainable behavioral change (Palmer, 2002). This is in line with the concept of education for sustainable development set by UNESCO as a global agenda to achieve the Sustainable Development Goals (SDGs).

The Adiwiyata program, which was launched by the Ministry of Environment and Forestry together with the Ministry of Education and Culture in 2006, is a tangible manifestation of the Indonesian government's commitment to integrating environmental education into the national education system. This program aims to create environmentally friendly schools with character through the implementation of four main components: environmentally sound policies, implementation of environmentally based curriculum, participatory-based environmental activities, and management of environmentally friendly supporting facilities. Until 2024, there are more than 9,000 schools throughout Indonesia that have participated in the Adiwiyata Program with various levels of achievement. The progress of the Adiwiyata program is closely related to international efforts to support education for sustainable development initiated by UNESCO (Unesco, 2020).

Adiwiyata Mandiri is the highest level in the hierarchy of the Adiwiyata Program which shows the school's independence in implementing environmental programs in a sustainable manner. There are four levels given to schools in environmental aspects, namely: 1) Schools with City/Regency Adiwiyata awards given by the Mayor/Regent, 2) Schools with Provincial Adiwiyata awards given by the Governor, 3) Schools with National Adiwiyata awards given by the Minister and related officials, and 4) Schools with the Independent Adiwiyata award given by the President or Minister of Environment (Esti Rahayu & Rahman Dongoran, 2024). Schools that achieve Adiwiyata Mandiri status not only succeed in running programs consistently, but also have the ability to foster and transfer experience to other schools. This status shows that the school has reached a level of maturity in environmental management and is able to become a reference for other schools. However, achieving Adiwiyata Mandiri status is not the final goal, but rather the beginning of a greater responsibility to continue to develop innovation and maintain the quality of the program.

SMAN 1 Sukakarya in Bekasi Regency, West Java, is one of the schools that has succeeded in achieving the status of Adiwiyata Mandiri in 2024 after going through a long journey starting from Adiwiyata Regency (2017), Adiwiyata Province (2018), to Adiwiyata Nasional (2019). This trip shows the school's commitment and consistency in implementing environmental programs. This school has succeeded in transforming the school culture to be more environmentally friendly, integrating environmental education in all aspects of learning, and developing various innovations in school environmental management. This achievement is inseparable from the support of all school stakeholders, ranging from principals, teachers, students, parents, to the surrounding community.

Despite the various achievements, the effectiveness of the implementation of the Adiwiyata Mandiri Program in increasing students' environmental awareness at SMAN 1 Sukakarya needs to be evaluated comprehensively and systematically. Environmental Education (PLH) is an effort to form a society that is sensitive and concerned about the environment as a whole and all the problems that accompany it, as well as a community that has the knowledge, skills,

attitudes, behaviors, motivations, and commitment to collaborate, both individually and in groups, to overcome various existing environmental issues and prevent new problems from arising (Noverita et al., 2022). Environmental awareness is a complex construct that includes cognitive dimensions (knowledge of the environment), affective (attitude and concern for the environment), and conative (tendency to behave in an environmentally friendly manner). In its implementation, the integration of environmental education into the curriculum is realized through the creation of a syllabus and learning implementation plan (RPP) that contains the values of concern for the environment, as well as the development of learning methods that invite students to actively participate in environmental conservation activities in schools (Mulyana, 2009). An in-depth evaluation is needed to understand the extent to which the program has successfully changed not only students' knowledge of the environment, but also their attitudes and behaviors in daily life. In addition, it is also necessary to identify the factors that support the success of the program and the challenges faced in its implementation.

This research is very important and relevant considering the limited empirical studies that examine the implementation of the Adiwiyata Mandiri Program, especially in the context of high schools in the region. Most of the existing research still focuses on the Regency or Provincial Adiwiyata level, while research on Adiwiyata Mandiri is still very limited. In fact, schools with Adiwiyata Mandiri status have different characteristics and challenges due to the higher level of program complexity and coaching responsibilities towards other schools. This research is expected to contribute to the development of environmental education theory and practice, as well as become a reference for other schools that want to implement similar programs.

The urgency of this research is also strengthened by the environmental conditions in the Bekasi area which are experiencing high ecological pressure due to rapid industrial growth and urbanization. Bekasi Regency as one of Jakarta's buffer areas faces various environmental problems such as water pollution, air pollution, and land degradation. In this context, the role of schools as agents of change in building environmental awareness is very strategic. SMAN 1 Sukakarya as an Adiwiyata Mandiri school is expected to be a catalyst for changing people's behavior through its students who will become the next generation. Therefore, this research not only has academic value, but also has broad practical implications for the development of environmental education in Indonesia.

METHOD

This study employed a qualitative approach with a descriptive case study design. The case study method was chosen to enable an in-depth and contextual exploration of the implementation of the Adiwiyata Mandiri Program at SMAN 1 Sukakarya as a single, bounded case. This approach allows the researcher to capture the complexity of the program's implementation in its natural setting.

The selection of research subjects was carried out using purposive sampling, a technique in which participants are selected based on specific criteria relevant to the research objectives. The informants in this study included key stakeholders directly involved in or affected by the Adiwiyata Mandiri Program. They consisted of: three individuals from the school leadership team (the principal, Adiwiyata coordinator, and environmental coach), six subject teachers who integrate environmental education into their lessons, fifteen students from grades X, XI, and XII who are actively involved in environmental activities, and two representatives from the school committee and local community.

Data collection was conducted through three main techniques: observation, interviews, and documentation. Observation was carried out to capture the implementation of the Adiwiyata Program in the school's daily life. Observed aspects included the physical condition of the school environment, environment-based learning activities, student participation in environmental programs, and the interaction between school members and their surroundings. The observation guidelines were developed based on the four core components of the Adiwiyata Program, with clearly defined indicators for each.

Interviews were conducted using structured guides tailored to each informant category, considering their unique roles and perspectives. The interviews aimed to explore perceptions of the Adiwiyata Program, experiences during its implementation, its impact on environmental awareness, as well as the challenges faced and strategies adopted to overcome them. Documentation was used to collect secondary data relevant to the program, including school policy documents, curriculum and syllabus materials, reports on environmental activities, photographs and videos of program implementation, and school achievement data related to environmental programs. Through this triangulation of data sources and methods, the study aimed to ensure the validity, depth, and credibility of the findings on the implementation of the Adiwiyata Mandiri Program.

RESULT AND DISCUSSION

The Adiwiyata program is interpreted as an initiative to create schools that are sensitive and cultured to the environment. This program is aimed at creating a supportive situation for schools as learning locations and awareness of school residents so that in the future the school residents can play a role in environmental conservation efforts (Hasan, 2021). The implementation of the Adiwiyata Mandiri Program at SMAN 1 Sukakarya has resulted in a fundamental transformation of the educational paradigm, from a conventional approach that is purely cognitive to a holistic approach that integrates cognitive, affective, and psychomotor aspects in the context of the environment. The Adiwiyata program aims in the long term to develop the character of caring for the environment in the younger generation who will act as agents of change in society to support a sustainable and environmentally friendly lifestyle. This research reveals that this transformation process does not occur instantly, but through systematic stages starting from changes in school policies, curriculum restructuring, to the development of an environmentally friendly school culture. The results of the interview with the principal, Dedy Soeryadi, S.Pd., M.M confirmed that "the biggest change we felt was a shift in mindset from seeing the environment as a learning object to a living and integrated subject in all aspects of school life." Documentation data shows that since the implementation of the program in 2017, there has been a significant increase in budget allocation for environmental programs from 8% to 18% of the total APBS, reflecting the school's growing commitment. This transformation is also reflected in the change in the school's vision which originally only emphasized academic achievement, now it has integrated the environmental dimension with the formulation "The realization of superior, characterful, and environmentally friendly schools towards a generation that cares about the earth". Pro-Environmental behavior change is a key indicator of the success of environmental education programs such as Adiwiyata, as the ultimate goal of such programs is to create a generation that acts responsibly towards the environment (Chawla & Cushing, 2007).

Participatory observation for 6 months revealed concrete manifestations of student behavior changes that were very encouraging and objectively measurable. In terms of waste management, the data shows that 97% of students have disposed of waste in its place, 89% have sorted waste properly, and 76% are active in the school waste bank program which has managed to collect an average of 2.5 tons of recycled waste per month. Water conservation behaviors showed remarkable results, with 94% of students turning off taps after use, 83% using water in moderation, and 67% actively monitoring and reporting water leaks. The energy-saving aspect recorded impressive achievements with 96% of students turning off unused lights and electronic equipment, 71% using stairs instead of elevators, and 58% utilizing optimal natural lighting. Changes in consumption patterns show a very positive trend, with 91% of students bringing their own drinking bottles, 84% reducing the use of single-use plastics, 73% bringing food supplies from home, and 62% choosing eco-friendly products. Most interesting was the change in transportation patterns, where 69% of students used bicycles or walked to school, 23% used public transportation, and only 8% used private vehicles. This data is reinforced by the results of in-depth interviews that reveal that 87% of students report implementing eco-friendly behaviors at home and influencing their families to do the same. The identification of the determinants of the success of the Adiwiyata Mandiri Program reveals the complexity of interactions between various elements that

support and hinder each other. The main supporting factor identified was the principal's transformational leadership that was able to inspire change, with a leadership score of 4.6 out of 5 based on teacher and student assessments. Teacher commitment shows a very high level, with 98% of teachers stating that they are ready to integrate environmental education into learning and 94% being active in school environmental activities. Parental and community support was also very strong, with 82% of parents stating full support for the program and 76% actively involved in school activities. However, the study also identified some significant challenges that require serious attention. Budget constraints are still a major obstacle, with the need for funds for green infrastructure development. The resistance to change of 12% of school citizens, especially in terms of green technology adaptation and change in routines, requires an intensive persuasive approach. The complexity of coordination between various stakeholders sometimes leads to program overlap and resource inefficiencies. The limitations of technological infrastructure, especially in terms of real-time environmental quality monitoring, are obstacles in the development of more sophisticated programs.

Discussion

The implementation of the Adiwiyata Mandiri Program at SMAN 1 Sukakarya has demonstrated a significant and sustainable systemic impact, both at the institutional level and across the broader educational ecosystem. At the institutional level, the school has experienced a remarkable improvement in reputation, as indicated by a 35% increase in student interest over the past three years. The attainment of the highest environmental recognition, the Mandiri status, has further solidified the school's position as a pioneer of green education in the region (Sterling & Orr, 2001). Financially, the program has yielded positive outcomes through operational cost savings resulting from energy and water efficiency, alongside additional income generated from the recycling and composting of waste products. These findings align with UNESCO (2020), which emphasizes that investments in green infrastructure can offer profitable economic returns in the medium term.

Socially, the most striking impact is the transformation of student behavior. Environmentally friendly habits acquired at school are transferred to the household, creating a ripple effect within the community. This supports Tilbury's (1995) assertion that schools possess a transformative role in shaping environmentally conscious behavior. Moreover, SMAN 1 Sukakarya has successfully mentored two other schools, both of which achieved Adiwiyata status. This peer-coaching strategy highlights the effectiveness of school-to-school collaboration in spreading best practices (Ballantyne & Packer, 2006).

These findings yield several strategic implications for program replication. First, a long-term commitment of at least five years is required to realize meaningful results, as supported by Henderson and Tilbury (2004) in their global review of sustainable school programs. Second, while the initial investment in eco-friendly infrastructure may be substantial, the long-term financial and reputational benefits justify the cost (UNEP, 2016). Third, the success of the program depends on a participatory approach involving all stakeholders, including students, educators, parents, and the surrounding community. This aligns with the principles of Education for Sustainable Development (ESD), which emphasizes the importance of cross-sector collaboration (UNESCO, 2017).

Building on the outcomes observed at SMAN 1 Sukakarya, future research on the Adiwiyata Program should prioritize several key directions. Longitudinal studies are essential to evaluate the long-term impact of the program on alumni's environmental behavior and to assess program sustainability following leadership transitions. This aligns with Tilbury and Cooke (2005), who argue that environmental education programs must be evaluated over extended timeframes to fully capture their influence. Moreover, school leadership dynamics should be considered, as program continuity is closely tied to the vision and commitment of school leaders (Fullan, 2001).

Secondly, there is an urgent need to develop context-specific research instruments tailored to Indonesia. These should include digital-based environmental awareness scales and tools to measure the economic impact of green

school programs. Robust instruments will improve the validity and reliability of program evaluation and support evidence-based policymaking (Creswell & Creswell, 2018). Thirdly, comparative studies across different school contexts—urban versus rural, public versus private, and across varying socioeconomic levels—will enhance understanding of the factors influencing program success. Such studies are instrumental in designing adaptable and context-sensitive replication models (Yin, 2014).

In conclusion, the findings from SMAN 1 Sukakarya show that the Adiwiyata Program does more than foster environmentally conscious schools; it facilitates a broader cultural shift toward sustainability. The program's systemic impact reinforces the need for ongoing, collaborative, and contextually responsive research to strengthen environmental education throughout Indonesia.

CONCLUSION

The implementation of the Adiwiyata Mandiri Program at SMAN 1 Sukakarya has been carried out comprehensively through environmentally friendly policies, an environment-based curriculum, participatory activities, and green infrastructure. The school has successfully integrated environmental education into all aspects of its operations, which has resulted in a 29.4% increase in students' environmental awareness across cognitive, affective, and conative domains. This progress is reflected in positive behavioral changes, particularly in waste management, water and energy conservation, and sustainable consumption habits. Supporting factors include committed leadership, active teacher and student involvement, parental support, and collaboration with external stakeholders, while limiting factors consist of budget constraints, limited infrastructure, low awareness among some individuals, and coordination challenges. To strengthen implementation, it is recommended to enhance managerial capacity, develop innovative learning models, and expand strategic partnerships.

Future research should focus on evaluating long-term behavioral impacts, comparing program outcomes across different school contexts, and exploring how leadership changes affect program continuity. Additionally, there is a need to develop standardized and digital-based measurement tools tailored to the Indonesian context, as well as studies that explore student-led initiatives and their role in shaping sustainability-oriented youth leadership.

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