Implementation of the Problem-Based Learning Model to Build Adiwiyata Schools through Strengthening Environmental Care Character in Elementary Schools

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ABSTRACT

This study aims to describe the implementation of the Problem-Based Learning (PBL) model in building Adiwiyata Schools through the strengthening of environmental care character in elementary schools. Using a qualitative approach with a case study method, data were collected through observation, in-depth interviews, and documentation. The results of the study show that the application of PBL successfully increased student engagement in various environmental activities such as waste management, reforestation, and water conservation, while also developing environmental care character traits including responsibility, awareness, and cooperation. Support from teachers, principals, parents, and the school environment proved to be crucial factors in the successful implementation of PBL, although several challenges such as limited facilities and student motivation still need to be addressed. The study concludes that PBL is an effective learning strategy to support the Adiwiyata School program and to foster environmental care character from an early age.

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1. INTRODUCTION

Education serves as the spearhead of a nation's progress, especially at the elementary school level, which plays a crucial role in sustaining the learning process. Learning at the elementary level is expected to provide meaningful experiences in students' lives, guiding them to become better individuals. Elementary education is not only a place for transferring knowledge but also a medium for instilling noble values and shaping students' personalities holistically. Therefore, the learning process at the elementary level must be designed to provide meaningful experiences, fostering the development of positive and sustainable attitudes and behaviors[1].

In line with this, Law Number 20 of 2013 on the National Education System emphasizes that the goal of national education is to develop students' abilities and to shape the character and civilization of a dignified nation in order to advance the nation's intellectual life. Education is also directed at developing students' potential so that they become individuals who believe in and are devoted to God Almighty, possess noble character, are healthy,

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[1] Mohamad Muspawi dan Moni Lukita, "Pengelolaan Pembiayaan Pendidikan di Sekolah Dasar," *Lectura : Jurnal Pendidikan*, 14.1 (2023), hal. 99–110, doi:10.31849/lectura.v14i1.12237.

knowledgeable, capable, creative, independent, and are democratic and responsible citizens.[2] According to UNESCO, the essence of education encompasses four main pillars: learning to know, learning to do, learning to be, and learning to live together.

These four pillars reflect the integration of spiritual intelligence (SQ), emotional intelligence (EQ), and intellectual intelligence (IQ). This idea aligns with the philosophy of Ki Hajar Dewantara, who emphasized that education is a process of guiding the life of a child in accordance with their natural disposition. In other words, each child should be guided so that their strengths and potential can develop optimally to achieve true happiness and well-being. Therefore, the role of teachers is crucial in instilling noble values, fostering environmental awareness, and developing critical thinking skills, so that students grow into humane individuals who are not easily swayed by the increasingly strong currents of globalization.[3]

To support these objectives, a child-friendly and environmentally-friendly learning environment is essential. One concrete manifestation of this effort is the implementation of the Adiwiyata School program. This program aligns with the vision of Environmental Education agreed upon on February 19, 2004, as an effort to accelerate the integration of environmental education into formal schools, particularly at the elementary and secondary levels. Through this program, it is hoped that all school members, especially students, will develop environmental awareness and cultivate a habit of living within a positive environmental culture.

Moreover, the program serves as a strategy to develop human resources with a strong national character, capable of addressing social, economic, and environmental challenges to achieve sustainable development across various regions.[4] Adiwiyata is one of the strategic initiatives of the Ministry of Environment aimed at instilling ecological knowledge and awareness among school communities. Through the implementation of this program, schools are expected to become healthy, clean environments that are free from harmful environmental impacts.[5] Along with the rapid development of technology, various impacts have emerged on students' character, including a decline in environmental awareness.

The Ministry of National Education (2010:10) defines environmental care character as attitudes and actions aimed at preventing damage and restoring the already damaged natural conditions. Therefore, environmental awareness must be manifested in concrete actions, such as maintaining the cleanliness of the surrounding environment. Some indicators of this character include: the habit of maintaining school cleanliness, the presence of trash bins and handwashing facilities, the availability of clean water and proper sanitation facilities, the separation of organic and inorganic waste, and adequate cleanliness facilities.[6] However, the reality shows that the value of environmental love is beginning to fade.

This can be seen from the behavior of littering, which is still commonly found. Based on observations and interviews at SDN 3 Karangkemojing, it was found that the level of students' environmental awareness is still low, as evidenced by the accumulation of trash scattered around the school area. One concrete effort to build environmental awareness in elementary schools is through the Adiwiyata School program. This program aims to create schools that are environmentally conscious and have an environmental culture, so that environmental character education is not just theoretical, but also reflected in the students' daily behaviors.

To support the achievement of Adiwiyata School goals, the implementation of a learning model that actively and meaningfully develops environmental care character is necessary. One relevant learning model is Problem-Based Learning (PBL). PBL emphasizes learning based on real problems that challenge students to think critically, creatively, and responsibly.[7] Problem-Based Learning provides students with the opportunity to be directly involved in the process of identifying and solving environmental problems in their surroundings. With this approach, students not only understand concepts but also internalize environmental care values through direct experiences (Barrows, 1996).

This is in line with the principles of character education, which emphasize the habituation of positive behaviors.[8] The implementation of PBL in the context of Adiwiyata school development is highly relevant because it demands collaboration, care, and real actions from students. In addition to enhancing academic competencies, the application of PBL also hones students' soft skills such as leadership, teamwork, and social responsibility

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[2] Muspawi dan Lukita, "Pengelolaan Pembiayaan Pendidikan di Sekolah Dasar," hal. 102.

[3] Berita Dan, "Pentingnya Pendidikan Parenting dalam Pembentukan Karakter Sejak Dini Anak," 4.8 (2025), hal. 22–25 (hal. 410).

[4] Anggun Gunawan, Al-farabi Pangandaran, dan Creative Commons, "Implementasi Program Sekolah Adiwiyata Sebagai Upaya Meningkatkan Sikap Peduli Lingkungan Siswa di MAN 2 Pangandaran," 04.1 (2025), hal. 51–58 (hal. 52).

[5] Riyanti Isaskar et al., "PEMBERDAYAAN GURU SEKOLAH Dalam PENGELOLAAN SAMPAH ORGANIK MENDUKUNG PROGRAM ADIWIYATA," 9.1 (2025), hal. 11–12.

[6] Gunawan, Pangandaran, dan Commons, "Implementasi Program Sekolah Adiwiyata Sebagai Upaya Meningkatkan Sikap Peduli Lingkungan Siswa di MAN 2 Pangandaran."

[7] Robert Maribe Branch, "Problem-Based Learning: What and How Do Students Learn?," *Educational Psychology Review*, 16.3 (2004), hal. 235–66.

[8] Cindy E. Hmelo-Silver dan Howard S. Barrows, "Goals and Strategies of a Problem-based Learning Facilitator," *Interdisciplinary Journal of Problem-Based Learning*, 1.1 (2006), hal. 5–22, doi:10.7771/1541-5015.1004.

(Savery, 2006). All of these competencies are essential for shaping an environmental care character. Furthermore, the PBL model encourages students to develop critical awareness of local environmental issues, such as waste management, water conservation, or school greening.

By addressing real problems, students learn that they have a role and capacity to make positive changes in their surrounding environment.[9] Previous research has shown that the implementation of PBL in environmental education can enhance students' conceptual understanding as well as strengthen pro-environmental behaviors (Tilbury, 1995). Thus, PBL is not only effective in improving cognitive learning outcomes but also in shaping attitudes and values that support the creation of an environmentally-conscious school culture.[10] Nevertheless, the success of implementing PBL in building environmental care character in elementary schools requires support from various parties, such as teachers, school principals, parents, and the surrounding community.

Teachers need to have the competence to design relevant and engaging problem-based learning scenarios for students (Tan, 2003). Based on this background, this article aims to examine the implementation of the Problem-Based Learning model in building Adiwiyata schools through the enhancement of environmental care character in elementary schools. It is hoped that the findings of this study can contribute to the development of effective learning strategies to support the Adiwiyata program and environmental character education at the elementary level.[11]

Previous research by Siti Zubaidah titled "Problem Based Learning to Improve Critical Thinking Skills and Student Character," and by Dwi Hargo Saputro and Susilo Herawati titled "The Implementation of Environment-Based Problem Based Learning to Enhance Students' Environmental Awareness in Elementary Schools." Therefore, through this study, research was conducted with the title "Implementation of the Problem Based Learning Model to Build Adiwiyata Schools Through the Enhancement of Environmental Care Character in Elementary Schools" as a concrete effort to develop holistic and competitive student character.

2. RESEARCH METHOD

This study uses a qualitative approach with a case study method to deeply describe the implementation of the Problem-Based Learning (PBL) model in building an Adiwiyata school through the enhancement of environmental care character in SD Negeri 3 Karangkemojing, Banyumas. The research focuses on the process of applying PBL in the classroom, the students' behavioral changes toward the environment during the learning process. The subjects were selected purposively, namely the fifth-grade teacher as the implementer of PBL and the students as the main participants.[12]

Data collection was carried out using participatory observation, in-depth interviews, and document study techniques. Observations were made to observe problem-based learning activities and student involvement in environmental care activities, such as the school cleanliness program and greening initiatives. Interviews were conducted with teachers, students, and the school principal to gain deeper insights into their experiences, perceptions, and challenges in implementing the PBL model. Documentation, including photos of activities, lesson plans (RPP), students' work, and the school's Adiwiyata program, was used to complement the data obtained from observations and interviews.[13]

Data yang diperoleh dianalisis menggunakan teknik analisis tematik, yaitu dengan mengidentifikasi pola-pola, tema, dan kategori yang muncul dari data lapangan. Tahapan analisis meliputi reduksi data, penyajian data, dan penarikan kesimpulan. Validitas data dijaga melalui teknik triangulasi sumber dan metode, member check, serta audit trail. Melalui pendekatan ini, diharapkan penelitian mampu memberikan gambaran komprehensif tentang bagaimana model PBL dapat membangun karakter peduli lingkungan sebagai bagian dari upaya pengembangan sekolah Adiwiyata secara berkelanjutan.[14]

3. RESULTS AND DISCUSSIONS
3.1 Research Results
1) Implementation of the Problem-Based Learning (PBL) Model

[9] Cindy E. Hmelo-Silver dan Howard S. Barrows, "Facilitating collaborative knowledge building," *Cognition and Instruction*, 26.1 (2008), hal. 48–94, doi:10.1080/07370000701798495.

[10] Päivi Rasi, "Book Review: Orchestrating Inquiry Learning," *The Interdisciplinary Journal of Problem-based Learning*, 9.1 (2015) <http://dx.doi.org/10.7771/1541-5015.1542>.

[11] Safira Eka Indrayani et al., "SISTEMATIC LITERATURE REVIEW: MODEL INQUIRY BASED LEARNING TERHADAP PENGINGKATAN," 8 (2024), hal. 408–20 (hal. 415).

[12] Muhammad Wahyu Ilhami et al., "Penerapan Metode Studi Kasus Dalam Penelitian Kualitatif," *Jurnal Ilmiah Wahana Pendidikan*, 10.9 (2024), hal. 462–69 <https://doi.org/10.5281/zenodo.11180129>.

[13] Ilhami et al., "Penerapan Metode Studi Kasus Dalam Penelitian Kualitatif."

[14] Gunawan, Pangandaran, dan Commons, "Implementasi Program Sekolah Adiwiyata Sebagai Upaya Meningkatkan Sikap Peduli Lingkungan Siswa di MAN 2 Pangandaran."

The results of observations and documentation show that the implementation of the PBL model in the fifth grade at SD Negeri 3 Karangkemojing takes place in several key stages, namely: presenting real-world environmental issues, small group discussions, data collection, and presenting solutions. The teacher acts as a facilitator, guiding students to identify environmental problems around the school, such as waste management and greening efforts. The learning process is active, with students showing enthusiasm in finding solutions and applying creative ideas to maintain the cleanliness of the school.[15]

2) Improvement of Environmental Care Character

Data from interviews, observations, and document studies reveal an improvement in students' environmental care character after the implementation of PBL. Students began to show behavioral changes such as disposing of waste in designated places, actively participating in greening activities, and forming environmental care groups at school. These changes were supported by learning based on real-world problems they encounter daily, which fostered a sense of ownership and responsibility toward the environment.[16]

To assess the impact of this program, the researcher used a questionnaire before and after the program was implemented. Here are the results of the analysis:

Tabel 1. Improvement of Students' Environmental Care Character after the Implementation of PBL

Aspect	Before Program	After Program	Improvement
Getting into the habit of disposing of waste in the proper place	20%	75%	55%
Participating in greening activities	15%	73%	58%
Initiative to maintain classroom cleanliness	18%	76%	58%

The research findings indicate that the implementation of the Problem-Based Learning (PBL) model at SD Negeri 3 Karangkemojing Banyumas significantly improved students' environmental care character. Through a problem-based approach that is relevant to real-life situations in the school environment, students became more aware of the importance of maintaining cleanliness, managing waste, and actively participating in greening programs. This aligns with the principles of character education, which emphasizes learning based on real experiences to instill positive values in students. These findings also support the theory that students' emotional involvement in real-world problems can drive attitude and behavior changes more effectively than conventional approaches.[17]

The implementation of PBL also influenced the improvement of students' critical thinking skills. During the learning process, students were trained to analyze environmental issues, formulate hypotheses, gather supporting information, and present innovative solutions. This process demonstrated the development of students' ability to think logically, consider various perspectives, and make responsible decisions. This aligns with Arends' (2012) view that PBL is effective in developing higher-order thinking skills, which are crucial competencies for facing the challenges of the 21st century.[18]

In addition to impacting character, the implementation of PBL also supports efforts to develop Adiwiyata-based schools. With students becoming more concerned about environmental issues faced by the school, Adiwiyata programs such as greening, waste management, and water conservation can be carried out more effectively and sustainably. This proves that the development of Adiwiyata schools is not only dependent on the formal programs run by the school but also heavily relies on the behavior and mindset changes of the school community, especially the students.[19]

Nevertheless, in its implementation, the PBL model also faces several challenges, such as limited time for learning, the need for teachers' skills in facilitating discussions, and the necessity for adequate facilities and infrastructure. Therefore, to optimize the success of PBL implementation in the context of character education and Adiwiyata schools, continuous training for teachers, the provision of supporting learning media, and active collaboration between the school, parents, and the community are required.[20]

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[15] Irene Preisilia Ilat et al., "Konsep Dasar , Faktor Pendukung dan Penghambat Strategi Pembelajaran Berbasis Masalah dan Implementasinya dalam Pendidikan," 2024.

[16] Alif Achadah dan Wildan Nur Mubarok, *Peran Program Adiwiyata pada Pembentukan Karakter Peduli Lingkungan Siswa di SMPN 1 Wajak*, *Tasyri` : Jurnal Tarbiyah-Syari`ah-Islamiyah*, 2022, XXIX, doi:10.52166/tasyri.v29i02.173.

[17] Nadia Devi Nurcahyani, "Upaya Meningkatkan Kemampuan Berpikir Kritis Peserta Didik Menggunakan Model Problem Based Learning (Pbl) Berpendekatan Lingkungan," 2024, hal. 808–14.

[18] Nurcahyani, "Upaya Meningkatkan Kemampuan Berpikir Kritis Peserta Didik Menggunakan Model Problem Based Learning (Pbl) Berpendekatan Lingkungan."

[19] Rasi, "Book Review: Orchestrating Inquiry Learning."

[20]

4. CONCLUSIONS

Based on the results of the study on the implementation of the Problem-Based Learning (PBL) model to build Adiwiyata schools through the enhancement of environmental care character and students' critical thinking skills at SD Negeri 3 Karangkemojing Banyumas, it can be concluded that the application of the PBL model is effective in achieving these goals. Problem-based learning, linked to real environmental issues, successfully increased students' awareness, concern, and initiative in maintaining the school environment.

Moreover, the implementation of PBL also made a significant contribution to improving students' critical thinking skills. Through a systematic problem-solving process, students are trained to identify problems, analyze various alternative solutions, and make decisions based on logical and reflective reasoning. Thus, the PBL model not only shapes environmental care character but also develops higher-order thinking competencies that are essential in 21st-century learning.

Overall, the results of this study indicate that the application of PBL supports the sustainable development of Adiwiyata schools. Therefore, it is recommended that problem-based learning models be more widely integrated into various school programs, especially those related to character education and the development of students' critical thinking skills.

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