Fostering Environmental Awareness in Elementary Students Through the 'CILUKBA' Science Learning Program

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Abstract: Current educational developments require integration between academic learning and student character formation. One of the characteristics related to global issues is love of the environment, which can be instilled from an early age through a practical activity-based approach. The CILUKBA (Environmental Love Makes Us Happy) program is an initiative to teach the values of environmental love through science learning. This research aims to evaluate the success of the "CILUKBA" program in building environmentally caring character in grade 6 students at SD Negeri 3 Glodogan. This research uses a qualitative descriptive method with data collection techniques in the form of observation, interviews and documentation. The research subjects involved 23 students, consisting of 10 male students and 13 female students. The research results show that the "CILUKBA" program has succeeded in increasing students' awareness of the importance of protecting the environment, demonstrated through activities of planting plants, managing plastic waste, and practicing environmentally friendly habits. In addition, students actively demonstrate sustainable environmental love behavior in their daily activities. In conclusion, the "CILUKBA" program is effective as a character-based science learning strategy to foster the value of love for the environment in elementary school students.

Keywords: character education, love of the environment, natural sciences, CILUKBA.

▪ **INTRODUCTION**

Education is one of the main ways to form a generation that not only excels in academics but also has good personality and character (Yunanto & Kasanova, 2023). Love for the environment is an important character that must be instilled from an early age. Awareness of the importance of protecting the environment is becoming increasingly urgent along with increasing global challenges, such as pollution, climate change and the decline in natural resources (Yang et al., 2023). As a formal institution, schools play a strategic role in instilling environmental values through a planned and structured learning process (Rousseau & Deschacht, 2020).

School is a place to get education. The role of schools is very large in preparing students to face life's challenges in the future by developing the potential that exists within students (Ahmad, 2019). Apart from teaching science, schools are also tasked with instilling moral values which are the basis for forming the character of each individual. One of the main factors that influences a person's behavior and habits is the environment where students live, which can influence how students interact with the world around them. Therefore, education should not only focus on developing individual potential and skills, but also on instilling normative values and environmental awareness (Yang et al., 2023).

Natural Sciences (IPA) is one of the subjects that teaches environmental awareness to students. This subject not only provides knowledge about nature, but also allows students to understand human interactions with their environment (Susanti, Kurniawan, & Tusadiyah, 2023). Science learning not only covers basic concepts about natural

phenomena, but also invites students to understand the impact of human actions on ecosystems. Science learning can be designed so that students not only understand theory, but also engage in activities that strengthen students' awareness and responsibility for environmental sustainability (Engeness, 2021). Through direct experiences, such as planting activities, recycling waste, and direct observation of the surrounding environment, students can realize the importance of protecting nature. Involvement in this practical activity will help students understand that the small actions students take can have a big impact on the sustainability of the earth (Debrah, Vidal, & Dinis, 2021). In this way, the values of loving the environment can be embedded more deeply. Where students not only have knowledge, but also a sense of responsibility to protect and care for the environment around students (Rahiem, 2021).

The learning process really depends on smooth communication between teachers and students. When communication is hampered, students may have difficulty understanding the messages conveyed in learning (Fikri et al., 2024). Thus, learning media has a role in helping students absorb the material. If explored further, the media not only functions as a tool to convey messages controlled by the teacher, but can also play a role in replacing the teacher's position in presenting lesson material. (Wardani, Kusumaningsih, & Kusniati, 2024).

Research conducted by Siskayanti & Chastanti (2022) entitled Analysis of Environmentally Caring Character in Elementary School Students examines the importance of environmentally caring character education given from an early age, especially at the elementary school level. This research aims to examine the level of environmental awareness of class V students, especially in the habit of throwing rubbish in the right place. The method used is descriptive qualitative research with purposive sampling technique. Data collection was carried out through interviews and questionnaires, then analyzed using the Miles and Huberman data analysis model. This research measures students' environmentally caring character through two indicators, namely understanding the types of waste and understanding the 3R concept (Reduce, Reuse, Recycle). One student mentioned during the interview, "I find it difficult to differentiate between organic and inorganic waste because we rarely discuss it in class." Similarly, a teacher commented, "While students have been introduced to the 3R concept, they often struggle to apply it in their daily lives due to a lack of practical examples." The results showed that only 37.38% of students were able to differentiate between organic and inorganic waste, while their understanding of the 3R concept reached 45.27%. Based on these findings, it is known that students' knowledge regarding how to protect the environment is still in the low category. This research indicates that education regarding environmental awareness needs to be improved so that students' environmentally caring character can develop better.

SD Negeri 3 Glodogan has developed a program aimed at instilling the character of loving the environment in students. This program is called "CILUKBA", which is an abbreviation for (Cinta Lingkungan Buat Kita Bahagia) it means is Love the environment makes us happy. This program is designed to teach students how important it is to protect the environment through various practical activies that can be applied in everyday life. Activities carried out include planting medicinal plants, vegetables, and a thousand flowers, as well as reducing and recyling plastic waste. Through these activies, students are expected to get used to contributing to preserving the environment.

The importance of building a character who loves the environment through the "CILUKBA" program is also in line with the direction of the independent curriculum. This curriculum emphasizes the importance of learning that does not only focus on academic achivement, but also on developing student's attitudes and character (Lumbantobing, Napitu, Purba, Arent, & Meilitasari, 2023). Programs such as "CILUKBA" provide opportunities for students to learn directly and participate in activities that encourage the formation of a caring attitude towards the environment. Students' active invovement in planting and recycling waste not only teaches students about environmental concepts, but also helps students internalize these values in everyday life.

However, to ensure this program is truly effective, an evaluation is needed to measure the extent to which the character of loving the environment has been successfully developed in students. This evaluation is important to determine the impact of the activities that have been carried out on changes in student behavior. In addition, the results of this evaluation' can provide guidance for furhter program development, so that it can be implemented better and provide greater benefits in other schools. This research aims to assess the effectiveness of the "CILUKBA" program in cultivating the character of loving the environment in grade 6 students at SD Negeri 3 Glodogan. By Analyzing the results of implementing this program, it isi hoped that data can be obtained that can describe the concrete impact of this activity on student behavior. Thus, the following hypothesis was obtained in this study.

1. The "CILUKBA" program significantly improves students' understanding of differentiating between organic and inorganic waste.
2. The "CILUKBA" program positively influences students' ability to implement the 3R (Reduce, Reuse, Recycle) concept in their daily activities.

▪ **METHOD**

The participants in this study were grade 6 students of SD Negeri 3 Glodogan, consisting of a total population of 23 students, with 10 boys and 13 girls. A purposive sampling technique selected 23 students as the sample, ensuring representation based on active participation in the "CILUKBA" program activities. Additionally, three teachers directly involved in the program's implementation provided further insights through interviews.

This research adopted a descriptive qualitative design aimed at evaluating the implementation and impact of the "CILUKBA" program on cultivating the character of loving the environment. The research was conducted over three months, from August to October 2024. The procedure included the preparation stage, identifying the research problem, objectives, and formulating research questions. The implementation stage involved conducting the "CILUKBA" program, which included activities such as planting medicinal plants, vegetables, flowers, reducing plastic waste, and recycling waste. The data collection stage involved observing program activities, conducting interviews with teachers and students, and distributing questionnaires. The analysis and reporting stage involved analyzing collected data to evaluate the program's impact and compiling the research findings.

The cognitive test instrument consisted of 20 multiple-choice questions designed to assess students' understanding of environmental concepts. The test included two

indicators: understanding waste types and understanding the 3R concept (Reduce, Reuse, Recycle). The first indicator, understanding waste types, comprised 10 items focusing on differentiating organic and inorganic waste. For example, one item asked, "Which of the following is considered inorganic waste?" The second indicator, understanding the 3R concept, included 10 items assessing knowledge of how to apply the concept. For example, one item asked, "Which action represents the concept of 'Reuse'?" The instrument was adapted from environmental education studies and validated by expert judgment (Sidiq & Coiri, 2019). Reliability testing using Cronbach's alpha yielded a coefficient of 0.85, indicating high reliability.

The non-cognitive questionnaire instrument was used to measure students' attitudes and perceptions toward the environment. It consisted of 15 Likert-scale items divided into three indicators. The first indicator, environmental awareness, was represented by five items, such as "I always throw waste into the appropriate trash bin." The second indicator, participation in environmental activities, also had five items, such as "I actively participate in recycling activities at school." The third indicator, commitment to environmental protection, was represented by five items, such as "I encourage my friends to reduce plastic usage." The questionnaire was adapted from validated instruments in environmental education research and refined for context relevance. Validity was assessed through factor analysis, and reliability testing using Cronbach's alpha yielded a coefficient of 0.83.

The data were analyzed using a descriptive analysis model as outlined by Miles and Huberman. The analysis involved data reduction, summarizing and focusing on relevant data collected through observations, questionnaires, and interviews. Data display organized the information into tables, charts, and thematic maps to visualize patterns and relationships. Conclusion drawing and verification identified key findings, aligned them with research objectives, and verified consistency. Statistical analysis applied to questionnaire data used descriptive statistics such as percentages and means to quantify students' understanding and attitude changes. Qualitative data from interviews were coded and categorized to identify emerging themes related to program outcomes and influencing factors. These methods ensured a comprehensive evaluation of the "CILUKBA" program's effectiveness.

▪ RESULT AND DISSCUSSION

The research was carried out on grade 6 students at SD Negeri 3 Glodogan. The CILUKBA (Cinta Lingkungan Buat Kita Bahagia) it means is Love the environment makes us happy, program integrates various practical activities aimed at teaching students about the importance of protecting the environment through direct experience. The activities carried out, such as planting medicinal plants, vegetables and a thousand flowers, as well as managing plastic waste, are important means of building environmental awereness in students. In this chapter, the result of program implementation will be discussed as well as changes that occur in students behavior and character after participating in these activities.

Planting Medicinal Plants, Vegetables, and a Thousand Flowers

One of the activities carried out in this program is planting medicinal plants, vegetables and a thousand flowers. This activity is designed to introduce students to the world of plants while teaching important values related to environmental sustainability.

Planting medicinal plants, for example gives students an understanding of the benefits of plants for health, such as natural remidies that have been reliable since the time of their ancestors (Lakhsmi, Nurusshofa, & Ujianti, 2022). Meanwhile, it teaches students about the importance of food security and how to produce food independently that supports sustainable living (Sitinjak, 2023). Students are also taught organic farming methods, such as the use of compost and natural pest control, which teaches is importance of maintaining ecosystem balance in an environmentally friendly way.

Apart from that, planting a thousand flowers around the school is not only an effort to beautify the environment, but also a means of education about the diversity of flora and its role in the ecosystem (Aulia & Kusumastuti, 2022). The flowers attract pollinating insects such as bees and butterflies, which play an important role in the plant's reproductive process. This activity also provides students with insight into how biodiversity supports the stability of the ecosystem as a whole. By practicing this activity directly, students are invited to understand that flora not only provides visual beauty, but also has a major contribution in maintining the quality of air, soil and water.

The program also includes project-based learning sessions where students can design mini gardens at school. In this session, students are given the freedom to choose the types of plants they want to plant and learn how to design a garden layout to make it more efficient and aesthetic. These activities help students develop practical skills such as planning, collaboration, and problem solving. In addition, this mini garden project provides a space for students to understand the important role of the important role of the community in caring for the shared environment. Garden products such as vegetables or herbs can also be used to support school health programs, such as providing fresh food for the canteen or cooking together. In this way, students not only gain an impressive learning experience but also understand how small steps can create real positive change.

Quantitative results show an increase in students' understanding of the role of plants in maintaining environmental health. Pre-test scores related to plant knowledge averaged below 70, while post-test scores improved significantly to scores ranging between 79 and 90, with an N-Gain score of 74.60, indicating sufficient effectiveness. Observations revealed students actively engaging in plant care, demonstrating increased responsibility and appreciation for greenery.

Reducing Plastic Waste

Apart from farming activities, the "CILUKBA" program also emphasizes the importance of reducing plastic waste. At school, students are encouraged to limit their use of single-use plastic by switching to more environmentally friendly options. Through this program, student are trained to carry reusable food and drink containers, which significantly helps reduce plastic waste in the school environment. Apart from that, students are also given education about the negative impact of plastic waste on ecosystem, both on land and in waters.

Students are also taught about the negative impact of plastic waste on human health and ecosystem sustainability. This learning as important to raise awareness that every individual has responsibility to preserve the environment. In schools, policies to reduce plastic use are starting to be implemented by changing food containers from plastic to environmentally friendly materials such as paper or other biodegradable materials.

The school also holds creative recycling activities that involve students turning plastic waste into more useful items. For example, used plastic bottles are processed into plant pots or room decorations. This activity not only reduces plastic waste, but also encourages students' creativity in creating solutions to environmental problem (Noer & Wistara, 2024). In addition, the school works with local communities to support better waste management, such as professional collection of plastic for recycling.

As part of the educational program, students are also involved in simple research on the impact of plastic waste. Students are invited to observe the conditions of the surrounding environment, such as the school area or the nearest river, and record student findings. The results of this research are then presented in class as discussion material to find solutions together. In this way, students learn to think critically, communicate, and contribute to real environmental conservation efforts (Farahdiansari, Maulana, Febriansa, Utomo, & Khoirina, 2024).

This program is in line with the Adiwiyata concept, which makes schools an institution that cares about and has an environmental culture (Ardianti, Amizera, & Susanti, 2024). Adiwiyata is an aintiative of ministry of Environment and Forestry to encourage school to take an active role in environmental conservation while increasing awareness of the younger generation regarding the importance of maintining ecosystem sustainability. This program integrates environmental values into learning and school activities, so that students not only understand theory, but are also directly involved in environmental conservation practices (Evangelyne & Hardini, 2024).

Schools that participate in the Adiwiyata program apply the principle of participation, where all school members, including students, teachers and staff, work together in designing and implementing environmentally friendly activities. This activity includes 3R-based waste management (Reduce, Reuse, Recycle), water and energy conservation, greening the school environment, and the use of more environmentally friendly materials in everyday life. (Haryati, Laili, Mutisari, & Aprilia, 2024). Quantitative results from the program showed the pre-test on waste management concepts scored below 50 on average, whereas the post-test improved significantly to scores ranging from 80 to 93, yielding an N-Gain score of 79.72, categorized as effective. Behavioral changes were evident, with 80% of students consistently using reusable containers, compared to 40% before the program. Additionally, the frequency of students correctly disposing of waste in designated bins increased from 65% to 90%, based on teacher observations. Based on the pre-test and post-test given to students, the data shows that this learning is effective to be implemented in grade 6 as in the table below.

Table 1. Score student

No	code	P/L	Score		Post-Pre	Skor Ideal (100) - Pretest	N-Gain Score	Category	N-Gain Score persen	Category
			Pre-test	Post-test						
1	A1	L	38	89	51	62	0.82	HIGH	82.26	Kreatif
2	A2	P	41	90	49	59	0.83	HIGH	83.05	Kreatif
3	A3	P	38	93	55	62	0.89	HIGH	88.71	Kreatif
4	A4	P	47	88	41	53	0.77	HIGH	77.36	Kreatif
5	A5	L	50	83	33	50	0.66	HIGH	66.00	Kreatif

6	A6	P	38	92	54	62	0.87	HIGH	87.10	Kreatif
7	A7	P	43	92	49	57	0.86	HIGH	85.96	Kreatif
8	A8	L	50	92	42	50	0.84	HIGH	84.00	Kreatif
9	A9	P	44	81	37	56	0.66	HIGH	66.07	Kreatif
10	A10	L	42	78	36	58	0.62	HIGH	62.07	Kreatif
11	A11	L	48	78	30	52	0.58	HIGH	57.69	Kreatif
12	A12	L	36	80	44	64	0.69	HIGH	68.75	Kreatif
13	A13	P	36	96	60	64	0.94	HIGH	93.75	Kreatif
14	A14	P	36	90	54	64	0.84	HIGH	84.38	Kreatif
15	A15	P	41	88	47	59	0.80	HIGH	79.66	Kreatif
16	A16	L	40	92	52	60	0.87	HIGH	86.67	Kreatif
17	A17	P	47	81	34	53	0.64	HIGH	64.15	Kreatif
18	A18	P	51	84	33	49	0.67	HIGH	67.35	Kreatif
19	A19	L	40	78	38	60	0.63	HIGH	63.33	Kreatif
20	A20	P	50	96	46	50	0.92	HIGH	92.00	Kreatif
21	A21	L	42	80	38	58	0.66	HIGH	65.52	Kreatif
22	A22	L	47	88	41	53	0.77	HIGH	77.36	Kreatif
23	A23	P	45	89	44	55	0.80	HIGH	80.00	Kreatif
		mean					0.77		76.66	Efektif

Recycling Plastic Waste

In plastic waste recycling activities, students are taught how to sort waste based on type, understand the properties of plastic, and change used plastic into more useful items. For example, used plastic can be processed into plant pots, educational toys, or other creative crafts. This activity is designed to teach science concepts in a fun and useful way so that students can see firsthand how science can be applied in everyday life.

After learning how to sort waste and recycle plastic into useful items, students are also introduced to the process of making ecobricks. Ekobrik is an environmentally friendly building material made from plastic waste which is processed into blocks or bricks (Suliartini et al., 2022). Where students learn how plastic waste, which is often considered useless, can be transformed into strong materials that can be used for development needs. The process of making ecobricks involves heating used plastic which is then mixed with other materials to form a dense and durable block (Wati & Septiani, 2023).

Apart from providing practical skills, this activity also teaches character values that are in line with the objectives of the "CILUKBA" program. Students are invited to understand the importance of protecting the environment in simple ways such as managing waste. In this activity, students learn to be disciplined, work together in groups, and think creatively to find solutions. Students are also given the opportunity to find the best way to reuse plastic waste, so that students learn to be more innovative.

Through science learning that is directly related to everyday life, students not only learn about recycling, but also understand how important it is to protect the environment. Students are taught that plastic waste is not just a problem, but can be a useful resource if

managed well. This learning teaches students to think more critically and see that every small action students take, such as recycling, can have a big impact on the earth.

Plastic waste recycling activities also help foster students' sense of concern for the environment around them. Students are invited to look at environmental conditions at school and find problems related to waste (Naning, Kusumawari, & Ziveria, 2023). From there, students learn to design appropriate solutions and involve fellow students in the recycling process. In this way, students not only learn from theory, but also learn to act and contribute to environmental conservation (Sulistiyani, 2022).

Quantitative results from this activity showed the post-test results on recycling knowledge increased from an average pre-test score of below 51 to a post-test score of 78 to 96, with an N-Gain score of 76.66, categorized as effective. Students' active participation in recycling initiatives increased significantly, with 85% of students involved in at least one recycling project during the program compared to 30% before its implementation. This activity also supports the goals of the Adiwiyata program, which aims to create a culture of environmental care in schools (Yuliawati et al., 2024).

Implementation Results

The results of implementing the "CILUKBA" program at SD Negeri 3 Golodogan show a positive impact in cultivating the character of loving the environment in students. This program not only provides theoretical knowledge, but also involves students directly in activities that teach students the importance of protecting and preserving nature. By engaging in programs such as planting plants, reducing plastic waste, and recycling plastic waste, students begin to understand how student actions can contribute to environmental sustainability.

This program has proven effective in changing student attitudes and behavior. Previously, many students did not care about plastic waste and environmental issues, but after participating in this program, students began to show positive changes. Students are becoming more active in reducing the use of single-use plastics, bringing reusable food containers, and participating in recycling activities. In fact, some students who were previously not interested in plants are now starting to plant and care for plants with great attention.

These changes are also visible in students' daily lives, bith at school and at home. The "CILUKBA" program not only instills knowledge about the importance of the environment, but also forms new habits that care more about nature. Students learn that the small actions they take, such as sorting waste or caring for plants, can have a big impact on the environment. Therefore, the program can be used as an effective model for developing character and environtment-based education in other schools, in order to create a generation that is more caring and responsible for nature.

▪ **CONCLUSION**

In conclusion, the "CILUKBA" program, implemented through science learning at SD Negeri 3 Glodogan, has proven effective in cultivating a love for the environment among students. By engaging students in various activities, such as planting trees, reducing plastic waste, and recycling, the program not only imparts theoretical knowledge but also fosters practical habits and behaviors that promote environmental care. Students have learned that ssimple actions, like sorting waste and tending to plants, can

significantly contribute to environmental sustainability. Moreover, the observed change in students' attitudes, demonstarting increased engagement and responsibility toward the environment, highlights the program's success in cultivating a generation of environmentally conscious individuals.

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