



Stimulating Environmental Awareness among Elementary School Children Through Integration of the PJBL Art Model

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ABSTRACT

Purpose: Everyone must have environmental awareness because it helps maintain the sustainability of living things. Otherwise, it can cause natural damage and threaten other living creatures. The formation of an environmentally conscious character can be integrated from an early age in elementary school learning. This study aimed to find the right PJBL-ART model formula for stimulating environmental awareness among elementary school students. **Method:** The research used is a qualitative approach with descriptive methods. To obtain maximum data, interviews and observations were conducted with 28 teachers in elementary schools in the Jakarta area.

Findings: The results of interviews and observations were recorded and analyzed based on the topic. The findings reveal that PJBL-ART model can stimulate environmental awareness if applied correctly and effectively. **Implication for Research and Practice:** This model can be an alternative solution for all teachers in increasing environmental awareness among elementary school students. Having been exposed to environmental awareness during their elementary school age, young students can grow into a generation that is pro-environmental. This research may also be treated as a pilot model that is integrated into learning to stimulate students' environmentally conscious character

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Introduction

The major causes of environmental degradation are pollution, damage, flooding, and reduction of various biological species. As a result, multiple types of diseases spread throughout the community (Nurlaili, 2018). Environmental issues get more severe because of those greedy individuals who do not care about the environment's health. These individuals have lost their attitude of responsibility and therefore the whole humanity feels the impact. It is important that humans should be aware of the positive benefits of a healthy environment; in order to protect and care for environmental health. The environment is a type of container which accommodates both living non-living beings. The human society depends on the environment because everything that humans need comes from the environment around them.

Since all humans being depend on the environment, they must keep the environment safe from all threats that can attack and damage it. The community can make efforts to maintain the beauty of the environment, one of which is to keep the it clean from all forms of pollution for which humans are responsible. To succeed in creating a healthy environment, humans must live side by side with cleanliness, believing in the principle of environmental cleanliness as the main factor to keep the sustainability of environment. However, in reality, many people still do not care about the cleanliness of the surrounding environment. In order to maintain the cleanliness of the domain, it is important that people always care for the sustainability of their environment. However, in reality, many people still do not care about the cleanliness of the surrounding environment. This can be proven by the emergence of various environmental pollution on land, at sea, and in the air. These various pollutions have caused severe effects on the environment. For instance, household waste is one of the most significant environmental contributors, negatively affecting human survival and health (Doriza & Putri, 2014; Lestari & Toyib, 2017) and one of the causes of flooding during the rainy season. It also causes various diseases that arise due to the contamination of groundwater through this garbage.

Environmental awareness is growing because environmental conditions are getting worse. It is a much felt need that humans need a sustainable environment which we can change provided we are concerned about the environment through our interests. Environmental concern means a general orientation of individuals towards the environment (Ahmed, Zaneldin, & Al Hassan, 2021; America, 2014). The level of a person's concern for environmental issues is a valuable predictor of environmentally conscious behaviour (Gholami et al., 2016; Paasche-Orlow et al., 2018). Consumers concerned about the environment find it easier to buy environmentally friendly products than those less worried about the environment (Sulthon, 2021). Environmental concern is expressed in various forms, such as concrete actions, views, ideas and thoughts regarding environmental problems, which are determined by educational background and the community's environment (Candan-Helvacı, 2022; Ozonur, 2021). The cultivation of environmental awareness in educational institutions is explained in attitudes and experiences of healthy living and responsibility for environmental sustainability. Development in attitudes and experiences towards caring for the environment can be created through learning activities in educational institutions.

Environmental awareness needs to be instilled early in childhood, such as at elementary school age. The Elementary School stage is the stage of further education after Early Childhood

Education. Being a potential phase to raise environmental awareness, it is necessary to integrate environment education into the curriculum. Several previous studies have proven that environmental awareness must be imparted early so that children love the surrounding environment (Pakpahan, 2022; Sari & Pujiastuti, 2023). As educators, it is a good idea to encourage children to interact with nature and other living creatures, and to develop a positive attitude towards environmental awareness. In addition, by interacting with the environment, children gain experience in the first years of life in increasing their interest and concern for the environment (Corpuz, San Andres, & Lagasca, 2022; Harun et al., 2020). Therefore, it is essential to introduce the natural environment during the golden age so that children grow up with a sense of love for the environment and care about their surroundings. Likewise, the location where the child lives also influences the child's environmental awareness. Research conducted by Durkan et al. (2016) states that children who live in the city centre are more concerned about the environment than those in rural areas. The location where children live can determine attitudes and experiences towards the environment.

There is a dearth of research-based teaching materials, especially sourced for students' social environment, and to teach students how to make an optimal use of environment to meet their needs. Self-assessment and teacher evaluation data show that students' environmental concern is only 40%, which is due to the lack of teaching materials and media regarding environmental awareness. A recent research (Sari & Pujiastuti, 2023) has proven that an integrated module with project-based learning is suitable for increasing understanding of concepts and environmental care attitudes for fourth-grade elementary school students and knowing the module's effectiveness. In addition, Candan-Helvacı (2022) revealed that the activity process contained in the STEM approach can influence the level of environmental awareness and their views on this process. However, research conducted by Susilawati et al. (2021) suggests that environmental education should focus on increasing environmental awareness. Socio-scientific issue-based learning is closely related to the project-based learning model, so it is assumed that it can stimulate students' environmental understanding.

Environmental awareness means not only having knowledge about the environment but also linking it with a series of attitudes, behaviours and willingness to act to overcome problems related to the environment. Schools must provide a platform through projects to increase environmental awareness through various learning activities, discussions, debates, seminars and other activities. This will stimulate students' enthusiasm for the environment and encourage them to take specific responsibilities towards environmental conservation. In this case, it is vital to fully understand the ecological awareness of prospective teachers and teach them why we need to protect the environment.

Environmental awareness trains students' sensitivity through attitudes, behaviour and willingness to act on environmental problems. The need for knowledge of ecological awareness is critical because it is a crucial step to reducing environmental damage due to various activities. Researchers have shown that environmental education is necessary to maintain ecological awareness. Research conducted by Goldman and Alkaher (2023) shows that environmental education can develop and increase public awareness of the environment. Therefore, it is hoped that it can open new insights for prospective teachers regarding environmental awareness to stimulate their students' character of environmental awareness. Various studies assess that successful environmental education programs provide information to students verbally and in writing and involve students in a project to improve student performance and environmental awareness.

Based on the preliminary study above, the current study attempted to develop a PJBL-ART learning model that stimulates environmental awareness. This is a model in which there is integration between fine arts, music, craft, cultural arts, literary arts, and nuances of project-based learning to produce a product. Hence, the current study is built upon this premise that environmental awareness can be stimulated from an early age through integrating the PJBL-ART model. To achieve this objective, the following two research questions were framed for this study.

1. What is the teacher's perception regarding elementary school students' environmental awareness?
2. What is the strategy for implementing the PJBL-ART model to stimulate elementary school students' environmental awareness?

Literature Review

- *Environmental Awareness*

Environmental awareness comprises cognitive, attitudinal, and behavioural components (America, 2014; Rusmawan, 2017). The cognitive part consists of knowledge of one's environment. This environmental knowledge concerns current ecological issues. At the same time, the attitude, in this case, concerns a person's attitude towards the environment. Some have pointed out that environmental perspectives capture a person's concern for or interest in a specific or general environmental, ecological, or energy-saving phenomenon (Rouhiainen & Vuorisalo, 2019; Sulthon, 2021). The behaviour measured in this study as an environmental awareness component is recycling behaviour. In addition, the primary cause of environmental awareness is ethics towards the environment. In environmental education, the concept of human status is part of nature. Here, a change is required regarding environmental ethics regarding the concept of a human value system as part of nature; not humans are born as conquerors of nature.

An attitude of environmental awareness means a behavioural tendency that consciously minimizes the adverse effects of one's behaviour on the environment (Boss & Krauss, 2022; Fauzia & Kelana, 2020; Okaz, 2013). Pro-environmental behaviour refers to people who show consistent behaviour and are aware of the concern for purchasing environmentally friendly products (Harun et al., 2020; Ichsan et al., 2020; Williams et al., 2002; Zakharova et al., 2020). Pro-environmental behavioural intentions are divided into two aspects: direct behaviour and indirect behaviour. Direct behaviour is the behaviour of buying green products, while indirect behaviour is general green behaviour such as minimizing consumption of resources and energy, recycling, avoiding products that damage the environment, obeying environmental regulations, and being an activist (Praimee & Boonserm, 2021; Rouhiainen & Vuorisalo, 2019).

- *Model PJBL-ART*

Project Learning is a learning model that focuses students on complex issues needed to conduct investigations and understand lessons through experiments (Chen & Yang, 2019; Hasanah, 2019). This model also aims to guide students in a collaborative project that integrates various curriculum subjects (materials), provides opportunities for students to

explore content (materials) using various meaningful ways for themselves, and conducts experiments collaboratively. Project Based Learning is a learning model that uses problems as a first step in gathering and integrating new knowledge based on experience and natural activities. PBL is designed for complex problems that students must investigate and understand (Adriyawati et al., 2020; Rahardjanto & Fauzi, 2019).

The learning of arts and crafts is an interaction of the educational process in which there is a reciprocal relationship between educators and students, and this reciprocal relationship has certain educational goals that use art as a medium of education by accommodating students' needs for creative activities according to their respective abilities (Appleton, Grandal Montero, & Jones, 2017; Caiman & Jakobson, 2022; Grant & Patterson, 2016). Art learning in elementary schools can be an effort to preserve culture because education functions as a preserver and successor of culture, a tool for cultural transformation, and a tool for developing individual students.

The PJBL-ART model in Figure 1 integrates projects into learning all aspects of art. Of course, the theme is environmental awareness. For example, in fine arts learning, students can produce beautiful paintings in a clean and beautiful environment. The model design components to be used are:

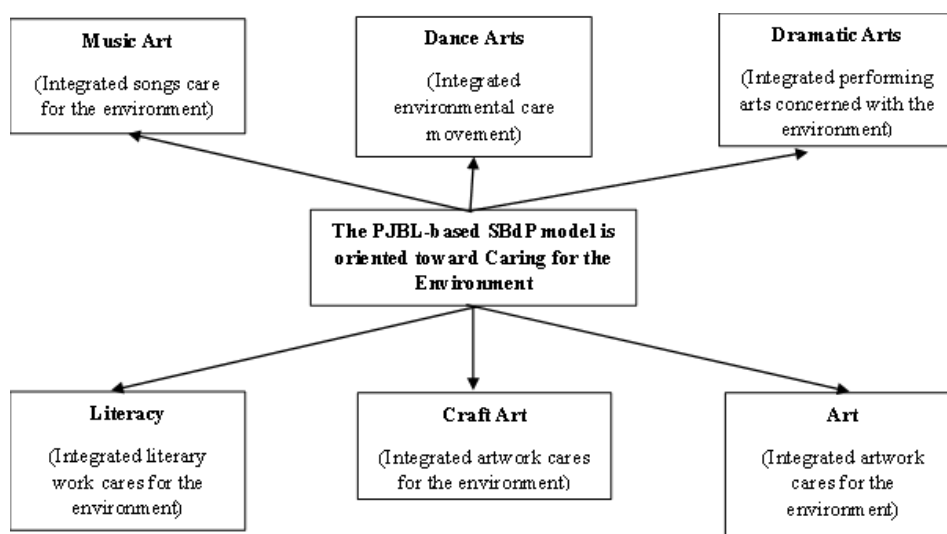


Figure 1. Conceptual Framework

Method

- *Research Design*

This study adopted a qualitative research technique with descriptive methods. Qualitative research is designed to contribute to theory, practice, policy, social issues, and action. The illustrative method is used because it describes the state of the subject or research object. This case illustrates the strategy for implementing the PJBL-ART model to stimulate students' environmental awareness. To obtain maximum data, interviews and

observations were conducted with 28 teachers in elementary schools in the Jakarta area. Interviews were conducted for 20 minutes with each informant and maximum data was obtained.

- *Research Sample*

The participants in this study were teachers from several elementary schools in the Jakarta area. The purposive sampling technique was used to identify the informants. A total of 28 teachers were selected based on (1) length of service, (2) essential educational background, (3) age, and (4) teaching experience.

- *Data Collection Procedures*

Interviews and observation methods were used as data collection procedures. The interview with 28 teachers lasted for one week as four teachers were interviewed every day for 20 minutes. Each interview was recorded and analyzed with the view that the objective of the interviews was to explore teachers' perceptions of students' environmental awareness at their teaching school. Furthermore, the researchers observed teachers in several schools using the PJBL-ART model to deliver art lessons. This activity aimed to directly follow the strategy for implementing the PJBL-ART model in classrooms in order to judge whether the PJBL-ART model was feasible in that situation.

- *Data Analysis*

Data collection techniques and data analysis in practice are not easily separated. The two activities run simultaneously. It means that data analysis should be done simultaneously with data collection until after the data collection is complete. Data analysis includes activities such as data organizing, selecting and codifying data into units, synthesizing data, looking for data patterns, finding what is essential and what is learned, and deciding what to present to others as readers of the research report. The expected conclusion in qualitative research is a new finding that has never existed before. Findings can be in the form of a description of an object that has previously not been studied. Hence, when it is examined, the causal or interactive relationships or theories become clear. Data analysis activities consist of data reduction, data display, and data conclusion drawing/verification, which are carried out interactively and continuously until complete so that the data reaches saturation.

Results

Research Question 1: What is the teacher's perception regarding elementary school students' environmental awareness?

Environmental awareness must be considered and instilled early on because this does not exist but needs to be trained and accustomed to. Caring for the environment is an attitude and action that always tries to prevent damage to the surrounding natural environment and develops efforts to repair the damage to nature that has already occurred (Ardoin, Bowers, & Gaillard, 2020; Dillon & Herman, 2023; Stöckert & Bogner, 2020). Therefore, an attitude of caring for the environment must be instilled as early as possible so that later, when a child grows up, the philosophy of caring for the environment is

attached to him. Students who have the character of caring for the environment are reflected in not destroying nature while in the school environment and maintaining the cleanliness and beauty of the class and school. One of the driving factors for the revitalization of environmental care is to provide environmental education as early as possible so that the character of each individual is formed.

This is evident from statements of several teachers from schools in DKI Jakarta, among others. For instance, Teacher 13 commented, "The children's environmental awareness in this school still needs to be improved. It is evident from the many students who litter and are not sensitive to the garbage they see." Teacher 20 added, "In my school, children still need to be able to maintain cleanliness, especially personal hygiene. The clothes used are often dirty and not ironed. Their nails and hair are also a lot long." Teacher 3 agreed by saying, "In my school, children's environmental awareness is still low; they often uproot green plants growing so that the garden becomes damaged."

These specimens of interview statements with teachers regarding environmental awareness show that almost 90% of teachers have stated that students' ecological understanding of their school environment still needed to be higher. The category of low environmental awareness of students can be classified as follows:

Table 1

Classification of Environmental Awareness Forms of Elementary School Students Based on Teacher Perceptions

Type	Forms of Negative Behavior that Appears	Percentage of teachers who answered
Self-awareness of the environment	The nails are long	50%
	Uniforms are not ironed	28.57%
	There is body odour	7.14%
	Socks are not washed regularly	57.14%
Awareness of the school environment	Littering everywhere	85.71
	Not being sensitive when they see trash scattered around	71.42%
	Uprooting plants	39.28%
	Ruining the garden	42.85%
	Scribbling on walls	60.71%

The informants unanimously agreed that teachers can play an effective role in developing students' environmental awareness during the elementary school stage, since the students in this age are completely under the influence of the teachers. There are several solutions to prevent the above negative behaviour including: (1) Before entering class, the school must implement the checks of nail, clothing, and other personal hygiene; (2) The school can impose fine on the defaulters, i.e., if someone violates environmental hygiene, points will be deducted from their weekly or monthly tests; and (3) The school can direct all students to minimize the use of plastics when they bring food, snacks or drinks, since plastic waste significantly pollutes the school environment.

Research question 2 What is the strategy for implementing the PJBL-ART model to stimulate elementary school students' environmental awareness?

The PJBL-ART model is a project-based learning model modified by art learning in elementary schools. All aspects of art can be integrated with environmental concerns so that directly and indirectly, students accustom themselves to having environmental awareness both when studying and not in the learning context. The PJBL-ART teachers have implemented the sampled model but with varying applications. There are several variations of the PJBL-ART implementation model carried out by teachers, as shown in Figure 2:

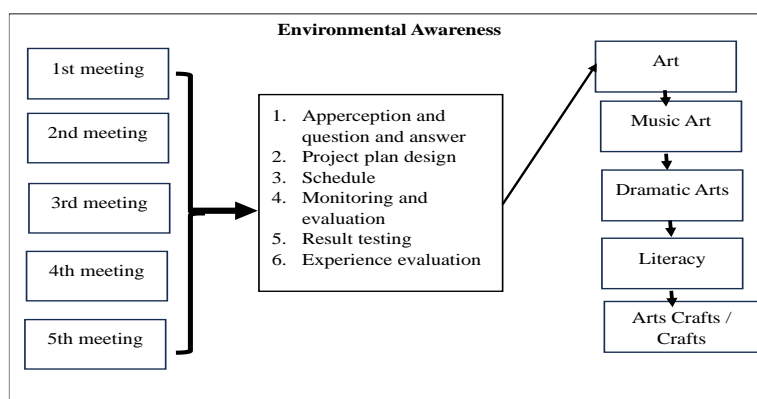


Figure 2. Variations in the application of the PJBL-ART model (A1)

Figure 2 shows that at each meeting, the teacher integrates the syntax of the PJBL model in art learning, starting from fine arts, music arts, drama arts, literacy, and arts/crafts, all of which have the theme of environmental awareness. From the variations in the application of the PJBL-ART model, teachers made some statements. For instance, Teacher 9 said, "The children look bored because each meeting produces work, and they tend to be pressured by the application of this model so that the targeted environmental awareness values are not embedded in students." Another teacher (No 18) commented, "When applied to children, they are happy because they are always taught to be creative in every art lesson. However, the weakness is that the products are often scattered because they are not displayed at the end."

In addition to variations in applying the PJBL-ART (A1) model, there are other variations implemented by elementary school teachers. These variations are coded (A2), as presented in Figure 3:

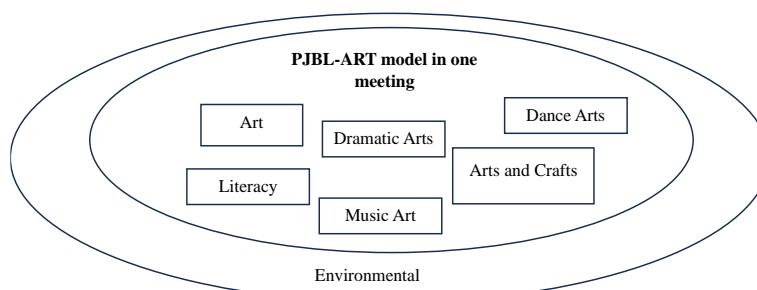


Figure 3. Variations in the application of the PJBL-ART model (A2)

Figure 3 illustrates that the teacher implements a project based on environmental awareness, which includes all aspects of art. Some teachers who apply this model stated, "When I implemented this model, the children were very enthusiastic. However, the problem is that it is difficult for the teacher to measure students' mastery and creativity because there is no evaluation. Learning is designed as if to prepare for the project only. At that time, the project was to hold an Earth Day performance. So, students participate in the event by presenting works or performances based on artistic aspects." (Teacher 28). Another teacher expressed, "when implementing this model, I was overwhelmed because so many aspects of art were created that made it less meaningful in increasing environmental awareness (Teacher 1).

Based on the two variations in the implementation of the PJBL-ART model in (A1) and (A2), the researcher analyzed the advantages, disadvantages, and obstacles to implementing this model. From there, researchers formulated a few strategies for implementing the PJBL-ART model in stimulating environmental awareness. These strategies were prepared in the form of a PJBL-ART Model Formula as shown in Table 2:

Table 2

PJBL-ART Model Formula based on the findings analyze

1 st & 3 rd meeting	2 nd & 4 th meeting	5 th , 6 th & 7 th meeting	8 th , 9 th & 10 th meeting	11 th meeting
1. The teacher conducts basic questions and answers about environmental conditions	1. The teacher monitors project work for each group. 2. At the second meeting, students were directed to create works of art and literature	1. The teacher monitors project work for each group. 2. At the third meeting, students are directed to make appearances in which the arts of music and drama are integrated.	1. The teacher monitors project work for each group. 2. Each team prepares for the stage and exhibition.	1. The teacher monitors project work for each group. 2. Earth Day stage activities which contain all the creations of students in the form of musical drama 3. In addition to the stage, there is a work gallery containing literary and artistic works and crafts made from waste materials. 4. Experience reflection
2. Form student groups	integrated with environmental awareness in the form of poetry, rhymes, and prose, as well as crafts from household waste materials.			
3. Defining environment-based projects.				
4. Create a project schedule				
5. the group will make an appearance that includes aspects of drama, dance, and music related to environmental awareness and other works of art such as literacy (literary art) and craft arts from household waste materials.				

Table 2 provides a blue-print how a teacher should plan the project, make a schedule, and divide the team on the first day. From second to the fifth day, the teacher can monitor and evaluate progress. On the day of the performance, students in groups present performances based on environmental awareness. In addition, teachers can also plan a work gallery for displaying environmental awareness-based literary works and works of art/crafts made from household waste materials.

Discussion

Health is the dream of every human being. Health is a state of well-being of body, soul, and social life that enables everyone to live productively, socially, and economically. Health is not a condition but an adjustment and a process. By process, it means that there is the adaptation of individuals not only to their physique but to their social environment (Elmer et al., 2017; Malkoc & Çolak, 2020). Life activities are hampered if there is no good health from the life lived. The environment is often cited as an important factor affecting an individual's health status, including the natural environment, man-built environment, and social environment. Just like disease spreads in the whole body if a balance cannot be maintained and illness occurs, environment also loses its normal health.

It is evident from the findings of this research that the PJBL-ART model can stimulate students' environmental awareness as long as the application is appropriate and meaningful. Students learn in groups to determine what works of art they will produce. Of course, in the context of environmental concerns, the running of the learning process indirectly familiarizes students with sensitivity and environmental awareness. Ecological awareness is embedded and entrenched in students if this continues sustainably. Education is one of the potential efforts to overcome the current and future environmental crises. Education delivered in the school environment will be more effective in touching and attaching to students. Instilling concern for the preservation of natural resources and the environment in the school environment can be carried out through a teaching and learning process that contains environmental education, the provision of a beautiful school environment, and is supported by school facilities (Selçuk & Yilmaz, 2020). Environmental education in the school environment is the primary capital for forming environmental ethics across generations.

The character of caring for the environment is usually shown in the natural environment, which always tries to prevent damage to the natural environment that occurs around us (Hasslöf & Malmberg, 2015). The character of caring for the environment is, of course, also shown by attitudes and actions to develop efforts to repair the damage to nature that has occurred. Caring for the environment means preserving the environment as well as possible; this can be done by maintaining, managing, restoring, and protecting the environment. Guidelines that must be considered in caring for or preserving the environment include (Ardoin et al., 2020) among others, preventing and saving natural resources from pollution and damage, avoiding actions that can cause decay, damage health and the environment, making the best use of renewable (non-replaceable) natural resources, and maintain and improve the environment for future generations.

Conclusion, Recommendations, and Implications

Based on research findings, the PJBL-ART model can effectively stimulate environmental awareness if applied correctly and correctly. This model can be an alternative solution for all teachers in increasing ecological awareness for elementary school students. If they are used to being sensitive to their environment since elementary school age, then when they grow up, they will become a pro-environmental generation. Teachers can develop rules for students by implementing the PJBL-ART model based on environmental awareness. For example, during the first to third meeting, the project focused on music; then, between the third to fifth meetings, the project focused on literary arts; and during the sixth and seventh meetings, projects focused on arts and crafts, and so on. At the end, students held performances and exhibitions related to the environmental awareness work and programs they had designed. In this way, students gain experience and are directly involved in environmental awareness activities so that indirectly, students' ecological awareness increases.

This model is a breakthrough in the world of education including environmental education in school learning as an appropriate alternative for growing students' ecological awareness from an early age. In addition, this research can produce innovative and proper media, methods and teaching materials for teachers to increase students' environmental awareness, especially in elementary schools. As for the government, this study can provide innovative findings related to environmental awareness so that the topic of ecological awareness should also be integrated into the curriculum in school institutions so that students' ecological understanding is sustainably trained from an early age to become ingrained in students.

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