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ANALYSIS OF PROJECT-BASED LEARNING MODEL ON RECYCLING USED BOTTLES TO ENHANCE CRITICAL THINKING SKILLS AND ECOPRENEURSHIP SKILLS IN ELEMENTARY SCHOOL STUDENTS

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Abstract

This research is a literature review that aims to investigate the project-based learning modelof recycling used bottles and its potential in improving critical thinking skills and ecopreneurship skills in elementary school students. The research method used is the literature method, in which the author searches and analyzes related studies that have been conducted previously. Some aspects discussed in this literature review include project-based learning, recycling concepts, critical thinking skills development, ecopreneurship empowerment, and effective pedagogical approaches. In this literature review, the author identifies and analyzes various studies that have been conducted on the used bottle recycling project-based learning model and its impact on critical thinking skills and ecopreneurship skills in elementary school students. The author also evaluates the advantages and disadvantages of this learning method as well as the factors that can affect its effectiveness. The results of this literature review indicate that the used bottle recycling project-based learning model can be effective in improving critical thinking skills and ecopreneurship skills in elementary school students. Several studies noted that this learning model can improve students' understanding of the importance of recycling and its impact on the environment.This literature review has important implications in the context of environmental education inprimary schools. The information found in this literature review can serve as a foundation for educators and researchers to design and develop learning models that are effective in improving critical thinking skills and ecopreneurship skills in students.

Keywords: Project-based learning, recycling, critical thinking skills, ecopreneurship skills.

INTRODUCTION

Environmental education is becoming increasingly important in the current era, where environmental issues are becoming more pressing. To develop students' awarenessand involvement in environmental issues, innovative and effective forms of learning are needed. One learning model that attracts attention is the project-based learning model. This model encourages students to be actively involved in real

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projects that have direct relevance to their lives (Rezkita & Wardani, 2018).

Education is the main foundation in the formation of individuals and communities who are aware of the environment and have the ability to think critically. In the context of primary school education, efforts to integrate environmental values and critical thinking skills are becoming increasingly important. One approach that can be taken is through a project-based learning model that focuses on recycling used bottles. This project not only provides insight into sustainable recycling practices, but also opens up opportunities for the development of ecopreneurship skills in young students (Jufri, J., LaFua, J., & Nurlila, 2019).

One interesting project to explore in the context of project-based learning is the recycling of used bottles. Recycling used bottles is an activity that can engage students in the creative process, produce valuable items from waste, and help reduce negative impacts on the environment. This literature study aims to investigate the effectiveness of the used bottle recycling project-based learning model in improving critical thinking skills and ecopreneurship skills in elementary school students.

Elementary schools play an important role in shaping children's character and understanding of the environment. In addition, awareness of the importance of disposing of waste in its place and reducing plastic waste is also urgently needed to create a clean, healthy and sustainable environment. Therefore, this study aims to investigate the project-based learning model of recycling used bottles and its potential in improving critical thinking skills and ecopreneurship skills in elementary school students.

Environmental education is very important to be instilled early on to elementary school students. In project-based learning, students can learn firsthand about the importance of disposing of waste in its place and reducing plastic waste through used bottle recycling activities. Embedding this awareness from an early age will form a responsible attitude towards the environment in the future (Naziyah et al., 2021). Teaching elementary school students to realize the importance of disposing of waste in its place and reducing plastic waste is a form of long-term investment in instilling sustainable environmental values. Students will understand that their individual actions can have a positive impact on the environment and the future of the earth.

In an effort to reduce the negative impact of plastic waste on the environment, students need to realize how important it is to reduce the use and disposal of non-degradable plastic waste. By learning the project-based learning model of recycling used bottles, students can see a real example of how plastic waste reduction can be done creatively and innovatively. Project-based learning models can improve critical thinking skills and ecopreneurship skills in elementary school students (Nurjanah et al., 2021). In the process of recycling used bottles, students will be invited to think

critically to find creative solutions in optimizing the use of used bottles. In addition, students w i l l also learn about sustainable entrepreneurship by creating environmentally friendly products from used bottles.

The results of this literature review have important implications in the context of environmental education in primary schools. By having a good understanding of the importance of disposing of waste in its place and reducing plastic waste, students can become agents of change in keeping the environment clean and reducing negative impacts on nature. From the above arguments, it is very clear that elementary school students' awareness of the importance of disposing of waste in its place and reducing plastic waste is very important. The project-based learning model of recycling used bottles can be an effective way to raise this awareness, while improving students' critical thinking and ecopreneurship skills. In this study, it is hoped that the information found will provide guidelines for educators and researchers to design and develop learning models that are more effective in raising students' awareness of environmental issues.

In this literature study, the author identifies and analyzes various studies that havebeen conducted on the used bottle recycling project-based learning model, as well as its impact on critical thinking skills and ecopreneurship skills in elementary school students. In addition, the author also evaluates the advantages and disadvantages of this learning method and the factors that can affect its effectiveness.

Findings from this literature review indicate that the used bottle recycling project-based learning model has significant potential in improving critical thinking skills and ecopreneurship skills in elementary school students (Aryanto et al., 2019). Several studies noted that this learning model can improve students' understanding of the importance of recycling and its impact on the environment.

This literature review has important implications in the context of environmental education in primary schools. The information found in this literature review can be a valuable foundation for educators and researchers in designing and developing learning models that are effective in improving critical thinking skills and ecopreneurship skills instudents.

METHODS

The research method applied in this research is a literature study, which involves researchers using various literature sources to obtain research data. The approach used is a qualitative approach. In this study, researchers collected data by analyzing books, literature, notes, and reports related to the problem to be solved.

A literature review is a process of scientific analysis that focuses on a particular topic. By conducting a literature review, researchers can provide an overview of developments in the topic. Through a literature review, researchers can identify relevant theories or methods, develop or evaluate these theories or methods, and identify discrepancies between the theory and field applications or existing

research results. The literature review process involves three important stages, namely: 1) Collecting relevant data and information, 2) Evaluate the data, theories, information, or research results that have been found, and 3) Analyze various publication sources such as books, research articles, and other sources that are relevant to the research questions that have been formulated previously (Cahyono et al., 2019).

The focus of the literature review is to collect various written sources such as books, journal articles, research reports, official documents, and other sources related to the research topic under investigation. The purpose of a literature review is to investigate,identify, and evaluate information that already exists in the scientific literature relevant toa specific topic or research question (Ridwan et al., 2021).

RESULTS AND DISCUSSION

Table 1. Literature Review Results

No.	Title	Author/Year	Results and Discussion	Difference
1	Validity of the Learner Activity Sheet (Lkpd) Based on *Projec t Based Learning* Growth and Development Materials to Train *Ecopreneurship* Skills of Participants Class XII High SchoolStudents	Ratna Lestari, Yuni Sri Rahayu,/ 2020	Project-based student activity sheets for teaching environmental entrepreneurship skills has several advantages. These include contextualizing the the content of with the potential of the potential of the region, developing practicalpractical skills, and fostering interest in entrepreneurship	analyzing the Project Based Learning model on recycling usedbottles,
2.	Improving Creative Thinking Skills in Literature Making *Ecopreneurship-Based* Children's Literature Through the Implementation of *Design Thinking*	Sani Aryanto, Apriyanti Widiansyah, Markum /2020	Analisis shows that the ability to think creatively students' creative thinking abilitywhouse the design thinking approach based on ecopreneurship is better than students who learnwith a conventional approach.	Creative thinking and children's literature, but focus on different contexts. The gap is thatthe journal we wrote is more highlighti ng critical thinking skills andecopreneurship critical thinking skills and
3.	The Effectiveness of Ecopreneurship-Based	Nur Azizah Tohiroh, Isnawati,Sari KusumaDewi	LKPD based on Ecopreneurship is effective in train creativeand innovative	students school Elementary Involved in

	Conventional Biotechnology Lkpd to Train Creative and Innovative Thinking of Grade XII Students Through PJBL Learning Method. Class XII Students' Innovative Thinking Through PJBL Learning Method	/2020	thinking LKPD ecopreneurship-based conventional biotechnology is effective train think creative and innovative. LKPD can beused in a competency-based curriculum.	Recycling used bottles. Journal This discussing the LKPD in context of conventional biotechnology and creative thinking creative thinking of grade XII students. The gapis thatjournal which the author presents emphasize s the analysis of model Project Based Learningon recycling used bottles for elementary school students.
4.	Learning Development with STEM Approach Integrated Science Entrepreneurship to Enhance Entrepreneurial Character	Silmi Kurnia Sa'adah, Sudarmin,and Skunda Diliarosta / 2021	The chemoentrepreneurs hip approach and Bioentrepreneurship can integrate entrepreneurial characters in chemistry and biology learning. Science-based learning science entrepreneurship-based learning applies science concepts in everyday life everyd ay life	Journal This highlighted the STEM approach approach and entrepreneurial character, while the journalthe author presents more focused on the ProjectBased modelLearningon used bottle recyclingand students' critical thinking skills critical thinking skillsof studentselementary school.
5.	Product Implementation Green Economy In the Young Entre preneurship Program Based onFriendly Environment In Man 2 Pangandaran	Dadah Jubaedah,Siti Sa'adah, Dety Mulyati/2022	By providing environmental awareness about global environment and empowerment education, it is ableto develop the entrepreneurial spirit of students in the at MAN 2 Pangandaran	Critical thinking skills of students elemen tary school. Journal This talking about green products economy and young entrepreneurs, the gap is that journal which the author presents

				explores more of the Project Based Learning model on r e c y c l i n g used bottles for elementary elementary school students.
6	Application of Learning Based on Hip Bioentrepreneurs Biology Learning To Improve Learning Outcomes Learning Outcomes, Entrepreneurial Interest, Creativity, Motivation,	Rafeah Husni / 2023	Bioentrepreneurship-based learning approach biology concepts can juxtaposed with entrepreneurial principles such as biotechnology, environment, plants, animals, andso on.The bioentrepreneurship approach can bioentrepreneurship approachcan be used as one of the innovative, contextualized learning approaches.and can stimulate students' interest in entrepreneurship	Journal This highlighting hip Bioentrepreneurs in biology learning, the gap is that journal which is the author present more focus on analyzing the model Project Based Learning on Recycling used bottles for elementary school students.

Project Based Learning

Project-based learning is an approach that actively engages students in practical and authentic tasks. These activities allow students to be directly involved in thelearning process and apply their knowledge in a real context (Strobel & van Barneveld, 2009). In this approach, projects are used as a means to develop critical thinking skillsin students. By placing students in an active role as decision makers, these projects encourage students to identify problems, find solutions, and evaluate the results of their work.

In the context of project-based learning, students are exposed to situations that often require complex problem solving. In designing and executing projects, students are required to think critically in identifying existing problems, analyzing the various factors involved, and formulating solutions that can be implemented. These critical thinking skills are very important, because can assist students in developing deep analytical and evaluative skills, as well as considering various alternatives in solving the problems at hand (Novianti et al., 2020).

At the project implementation stage, students should plan and engage in a

series of activities that require critical thinking. They need to formulate the necessary steps, organize resources, collect data, and apply appropriate methods and strategies. In this process, students are invited to develop critical thinking skills through in-depth analysisof the factors that influence project implementation and consider the possible impacts (Sari & Ardianti, 2021).

When the project is complete, students are faced with an evaluation process to evaluate the results of their work. In this stage, students are invited to think critically in identifying the successes and shortcomings of the projects they have done. This evaluation can involve self-reflection, mutual assessment from others, and further analysis of the results achieved (Almulla, 2020). By engaging students in a critical evaluation process, project-based learning can effectively enhance their critical thinkingskills in a real context and prepare them to face real-life challenges.

Recycling Concept

Understanding the concept of recycling plays an important role in improving students' ecopreneurship skills in primary schools. In this context, education on the importance of recycling is essential. Through this understanding, students can realize that recycling is an effort to reduce waste and care for the environment (Petre et al., 2019). By understanding this importance, students become more aware of the positive impact that recycling practices can have in maintaining environmental sustainabilityand preservation.

In addition to understanding the importance of recycling, students also need to learn about how to involve recycling in their daily lives. They need to learn to recognize the types of materials that can be recycled and understand the processing and benefits of recycling. For example, students can learn that used plastic bottles can be used as materials to recreate useful products, such as handicrafts or materials for other purposes. By engaging in daily recycling practices, students can recognize how important an individual's role is in protecting and caring for the environment.

Furthermore, learning about environmentally friendly waste management is alsoan important part of understanding the concept of recycling. Students need to learn howto sort, collect and process waste in the right way so that it can be reused. They can learn about environmentally friendly waste management systems, such as used plastic bottles. With this knowledge, students can develop ecopreneurship skills which include the ability to create innovative products from waste that has been collected and processed (Dhir et al., 2021).

In the context of primary school education, learning about the concept of recycling can be done through a project-based learning approach (Dasar, 2023). Students can be given a task or project to recycle used materials in their home their surroundings, such as plastic bottles or packaging paper. In this process, they will learn to think critically and creatively to develop new ideas and see the business opportunities that can be created from recycling practices. This approach can effectively develop students' critical thinking and ecopreneurship skills, as well asprovide hands-on experience in managing waste in an environmentally friendly way (Sulistiyani, 2022).

An understanding of the concept of recycling is essential in improving students' ecopreneurship skills in elementary school. Students need to learn about the importanceof recycling, involving recycling in daily life, and managing waste in an environmentally friendly way. Through project-based learning and hands-on experience, students can develop critical thinking and ecopreneurship skills that have the potential to generate positive impacts for the environment and encourage awareness of sustainability (Rudolof Ngalu, 2019).

Critical Thinking Skills

Critical thinking skills are important abilities that must be developed in students,because through these skills they can critically analyze information, make decisions based on available evidence, and solve complex problems (Puspita & Dewi, 2021). In this study, we aim to see how a project-based learning model of recycling used bottles can contribute to improving critical thinking skills in elementary school students.

The project-based learning model of recycling used bottles provides an opportunity for students to train and hone their critical thinking skills. In each stage of the project, students must analyze existing information, learn the correct recycling procedures, and plan and implement appropriate actions. This process encourages students to think critically in completing the tasks given (Meilana et al., 2020).

In the project-based learning model of recycling used bottles, students are also encouraged to make decisions based on evidence. They must consider various factors, such as the type and quality of used bottles to be processed, the most effective recycling method, and the impact of the decisions made. This decision-making process involves students' critical thinking skills in seeing the consequences of each choice.

In solving complex problems, students need to apply their critical thinking skills. In the project-based learning model of recycling used bottles, students are faced with the challenge of identifying problems, developing innovative solutions, and implementing appropriate actions. In this process, students can train their ability to analyze problems thoroughly and use critical thinking to find the most effective solution (Susanto, 2021).

The results of this literature review show that the used bottle recycling project- based learning model can be effective in improving critical thinking skills in elementaryschool students. Through this model, students can hone their ability to critically analyzeinformation, make decisions based on available evidence, and solve complex problems with thinking (Syaharuddin & Susanto, 2019). The implications of this literature review can provide a foundation for educators and researchers to design and develop learning models that areeffective in improving critical thinking skills in students.

Ecopreneurship Empowerment

Ecopreneurship empowerment involves developing sustainable

entrepreneurial attitudes and skills. The goal of this empowerment is to maintain a balance between economic benefits and environmental impacts (Salam et al., 2023). In the context of education, ecopreneurship empowerment can be done through learning that focuses on the concept of recycling and utilization of used bottles.

In the learning process, students need to be provided with the necessary knowledge and skills to identify sustainable business opportunities relating to the recycling of used bottles. Through an understanding of the concept of recycling, students can recognize the business value of used bottles that are mostly considered as waste. They can learn how to utilize used bottles into useful products, such as craft items or reusable products.

The importance of ecopreneurship empowerment lies in strengthening students' attitudes and skills in developing sustainable businesses (Umardiyah et al., 2023).Through project-based learning, students can practice entrepreneurial skills, such as business planning, resource management, and marketing of environmentally friendly products. This will help students develop critical and innovative ways of thinking in facing various challenges that exist in the real world.

In addition, ecopreneurship empowerment also provides an opportunity for students to understand the implications in social and environmental aspects of a business. By studying the project-based learning model of recycling used bottles, students can increase their understanding of the importance of recycling and how to create a positive impact on the environment through the business they build. They can also recognize the importance of cooperation and collaboration to achieve economicallyand environmentally sustainable goals (Prasetyo et al., 2023).

In the context of environmental education in elementary schools, this literature review provides a strong foundation for educators and researchers to design and develop learning models that are effective in improving critical thinking skills and ecopreneurship skills in students. By emphasizing project-based learning and the concept of recycling used bottles, students can become agents of change who have high environmental awareness and are able to be entrepreneurial in a sustainable manner (Aryanto et al., 2021). This will have a positive impact on society and the environment around them. Therefore, it is important for educators and researchers to continue developing innovative and relevant learning methods by incorporating entrepreneurshipand environmental aspects in the primary school curriculum.

Effective Pedagogical Approach

In the context of understanding and applying the material, an effective pedagogical approach needs to be applied. This approach includes active, collaborative and reflective learning that will encourage students to be actively involved in thelearning process (Pradifta, 2023). In addition, learning methods that involve collaboration with classmates are also able to improve students' understanding through interactions and discussions that involve various points of view.

Active Learning: One effective pedagogical approach that can be applied is

active learning. In active learning, students are not only the recipients of information, but also actively construct their own understanding through various activities such as discussions, experiments, or projects. Through active learning, students can develop critical and analytical thinking skills as they are challenged to analyze and solveproblems relevant to the learning topic (Muhtadi, 2023).

Collaborative Learning: In addition to active learning, effective pedagogical approaches also include collaborative learning. Through collaborative learning, studentscan learn through interaction and cooperation with their classmates (Dewi, N., K., N. et al., 2020). In the context of the project-based learning model of recycling used bottles, students can work in groups to identify environmental problems related to plastic waste and design sustainable solutions. This collaboration not only improves students' understanding of the topic, but also develops cooperation, communication and leadership skills.

Reflective Learning: Besides active and collaborative learning, an effective pedagogical approach also involves reflective learning. In reflective learning, students are encouraged to reflect on their learning experiences and gain a deeper understanding (Kamarudin, 2021). In the context of project-based learning of used bottle recycling, students can reflect on what they learned about used bottle recycling, the environmental impact of plastic waste, and how they can act as ecopreneurs to address the issue. Reflective learning helps students develop sustainable understanding and improve their metacognitive skills.

Effective pedagogical approaches, such as active, collaborative and reflective learning, have an important role in improving critical thinking skills and ecopreneurshipskills in elementary school students in the context of project-based learning model of recycling used bottles. Through the application of these approaches, students can actively engage, collaborate with classmates and reflect on their experiences in the learning process. Active and collaborative learning enhances students' understanding through interaction and discussion, while reflective learning helps students develop deeper understanding. Thus, an effective pedagogical approach is a strong foundation indesigning learning models that can improve critical thinking skills and ecopreneurship skills in students.

CONCLUSIONS

Based on the literature review conducted, this research highlights the used bottlerecycling project-based learning model as a potential approach to improve critical thinking skills and ecopreneurship skills in elementary school students. Through the literature method, the authors conducted a search and analysis of related studies that have been conducted previously.

In this literature review, the authors identify and analyze various studies that have been conducted on the project-based learning model of recycling used bottles and its impact on critical thinking skills and ecopreneurship skills in elementary school students. There are several aspects that have been discussed, including project-based learning, recycling concepts, critical thinking skills development, ecopreneurship empowerment, and effective pedagogical approaches. An evaluation

of the advantages and disadvantages of this learning method and the factors that influence itseffectiveness was also conducted.

The results of the literature review indicate that the used bottle recycling project-based learning model is an effective method in improving critical thinking skillsand ecopreneurship skills of elementary school students. Several studies noted that this learning model can improve students' understanding of the importance of recycling and its impact on the environment. In the context of environmental education in primary schools, this literature review has important implications.

The information found in this literature review can serve as a foundation for educators and researchers in designing and developing effective learning models to improve critical thinking skills and ecopreneurship skills in students. By utilizing the potential of used bottle recycling as a learning project, students can learn about environmental conservation efforts and sustainable entrepreneurial development.

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