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Project based learning model - Eco pedagogy on environmental health material in public junior high schools in Sukoharjo regency

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Abstract: The application of the Project Based Learning – Ecopedagogy learning model in learning is expected to change students' ecological intelligence to improve environmental health problems by providing knowledge to change attitudes and improve skills regarding the environment. This study aims to analyze the implementation of the independent curriculum and compile and analyze the performance and effectiveness of the Project Based Learning (PjBL) – Ecopedagogy Model in junior high schools throughout Sukoharjo Regency. The researcher uses the research and development (R&D) method; the researcher will develop a product as a social studies learning design, namely the Project Based Learning – Ecopedagogy Model in junior high schools throughout the Regency. The researcher then tested the data that had been obtained using the data triangulation method. Data analysis in this study used qualitative and quantitative descriptive analysis techniques. The results of this study are the results of data recapitulation which show that 84% of junior high schools have implemented student understanding of the independent curriculum. The PjBL learning model shows that it can influence the increase in student activity in learning about health.

Keywords: *Environmental health, Independent curriculum, Learning model, Project based learning (PjBL)– Ecopedagogy.*

1. Introduction

The ecological crisis is the vital issue that faces all of humankind. Nature education is, therefore, crucial for the development of environmental consciousness and for strengthening the ability of the individuals and communities to resist the environmentally destructive forces of the crisis. Traditional nature education models often simplify environmental issues by not critically examining their social, cultural, and practical relevance [1]. The current condition of environmental awareness among junior high school students still needs to improve. The beginning of the driving school program was one of the initiatives the Ministry of Education and Culture described in introducing autonomous learning [2]. The independent learning curriculum focuses on freedom and creative thinking. The educational curriculum is an educational component to update the quality of education the government provides [3]. The curriculum emphasizes several aspects, namely, knowledge, attitudes, and skills [4]. The Indonesian Minister of Education and Culture established Merdeka Belajar, a novel way to teach and learn to increase productivity, particularly during the COVID-19 epidemic [5]. This curriculum gives students the freedom to develop by providing more active opportunities for students.

Problem-based learning and case studies are widely used because they are tied to the output of the independent curriculum, one of which is Project-Based Learning (PjBL) [6]. The PjBL teaching model is often called a teaching method that uses problems in its system to make it easier for students to understand and absorb the theory provided. Looking for methods to improve the strategies used and see their workplace performance [7]. Using a contextual approach, this strategy improves students' critical thinking abilities [8]. They must evaluate the choice made as the best means of resolving the issue. Another component of the idea offered is weighing the advantages and disadvantages of a choice made

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as a remedy. The PjBL model is a method of instruction where students work directly on a project [9]. Project work is often structured by several tasks based on questions and problems that require students to think critically to find solutions. Learning using the PjBL method is a technique that provides innovation in the art of teaching [10].

The government policy regarding implementing environmental education in social studies subjects in junior high schools in Sukoharjo Regency has yet to be implemented. In a factual context, attitudes and concern for the environment have yet to be fully formed in students. Ecological problems were found at SMPN (State Junior High School) in Sukoharjo Regency; based on the results of observations by researchers at the school, students needed to have ecological awareness of themselves and their environment. Students do not care about the school environment's cleanliness and beauty and do not maintain physical and spiritual health.

Implementing differentiated social studies learning in the independent learning curriculum and determined learning outcomes positively impact teachers and students. Through differentiated learning, teachers feel happy because students are more enthusiastic and interested; this is manifested in the form of products produced by students in creative education. However, the challenges teachers face at the differentiation stage of the process are that teachers still need clarification when differentiating the teaching materials that should be given to various students. Through individualized learning in the autonomous curriculum, students can express their learning abilities depending on their potential and interests [11].

The PjBL model developed in this study collaborates with Ecopedagogy to increase awareness of environmental health. This refers to Paulo Freire, famous for his method of learning letters. Education towards an ecological pedagogical approach is an approach towards the multidisciplinary development of students in a meaningful way. This means that learning is not developmentally oriented only to reach the cognitive domain but must cover several fields, including cognitive, affective, and psychological. PjBL is a new approach to sustainable learning aimed at Education for Sustainable Development (ESD), where PjBL can give rise to real-world problems [12].

Ecopedagogy-based learning, founded on the development principle, strongly emphasizes the creation of content that goes beyond textual elements and requires a contextual approach. To enable students to create knowledge meaningfully, education must be established within the context of the student's life, utilizing media and sources. This means that to develop students' knowledge and comprehension fully, learning must be multidisciplinary. In addition, Ecopedagogy-based education aims to fully comprehend the interconnectedness of human nature and the natural world, which has consequences for students' character development and the development of critical consciousness [13].

Ecopedagogy emerged as a reaction to the educational practices that have been taking place in schools. Ecopedagogy is a movement in education that aims to help students develop into conscious, understanding, and capable persons who value environmental conservation [14]. Meanwhile, according to [15], Ecopedagogy is a method of teaching that cultivates in students a sense of independence and autonomy, the capacity to learn from experiences outside of the classroom, and an awareness of how their actions affect both the environment and oneself [16]. Critical theory and critical pedagogy support Ecopedagogy as a learning technique [17]. Therefore, ecopedagogy-based education can build essential awareness and develop students' character to understand their essence as humans who have a relationship with nature and manifest this awareness through wise behavior towards nature.

This research has an update in that the PjBL model through learning is oriented towards the principles of Ecopedagogy. The syntax of the Project Learning model is learning that involves students' activeness in solving problems [18], conducted separately or in groups via scientific phases with time constraints, culminating in a final result that will be displayed to others [19]. The advantage of the PjBL model is that it can increase students' curiosity, problem-solving abilities, cooperative attitudes, and resource management skills [20].

This study aims to analyze the actual conditions of the implementation of the independent curriculum in junior high schools throughout Sukoharjo Regency, in educational research and R&D, researchers will develop a product as a social studies learning design, namely the PjBL Model - Ecopedagogy in learning is expected to be able to change students' ecological intelligence to improve

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environmental health problems by providing knowledge to change attitudes and improve skills about environmental health.

2. Methodology

According to Talcott Parsons functional, structural theory, this research focuses on efforts to instill character education. In this research, researchers used the type of research and development (R&D). According to Sugiyono, R&D research methods are used to produce specific products and test the effectiveness of these products [21]. According to Sukmadinata, R&D has the idea of combining three methods to support the birth of a model: preliminary studies, evaluative at the model testing process stage, and experimental at the model efficacy testing stage [22].

In education and R&D research, researchers will develop a product as a social studies learning design, PjBL Model - Ecopedagogy for to improve environmental problems by providing knowledge to change attitudes and improve skills regarding the environment health in Middle Schools throughout the District. Sukoharjo then validated the learning model product.

2.1. Research Procedures

The development steps chosen by the researcher refer to the steps in implementing the research and development strategy according to Sukmadinata, this is intended to simplify the research process, but the research steps are still guided by theory [23]: Planning stage, Development stage, validation stage, dissemination, and implementation.

2.2. Data Sources and Research Subjects

The data sources in this research are social studies material experts and middle school social studies teachers. The type of data used in this development research is quantitative data. Quantitative data was obtained through observations, interviews, and distribution of questionnaires resulting from validation and field trials, plus the data obtained included input from expert validators and junior high school social studies teachers. The test subjects in this research were junior high school students in Sukoharjo. The schools used as research locations include SMP Negeri 1 Grogol, SMP Muhamadiyah 1 Kartosuro, and SMP Negeri 2 Sukoharjo. The junior high school was used as a research testing ground because there has yet to be much development of the PjBL - Ecopedagogy model for to improve environmental problems by providing knowledge to change attitudes and improve skills regarding environmental health.

2.3. Data Collection Techniques and Instruments

The initial stage of this development was carried out by collecting initial data regarding using literature studies to obtain theoretical data on learning models and previous research. Apart from that, researchers conducted field studies regarding the conditions for implementing the independent learning curriculum, students' understanding of caring for the environment, and learning models in junior high school students throughout the District. Sukoharjo. The next stage is to develop a PjBL model - Ecopedagogy- by compiling research instruments and a learning implementation plan (RPP). The final step is to implement and determine the effectiveness of the PjBL - Ecopedagogy Model for to improve environmental problems by providing knowledge to change attitudes and improve skills regarding environmental health.

2.4. Data Validity Test, Validity Test and Reliability

After the researcher obtained the data, the researcher then tested the data by using the data triangulation method. Testing the validity of data in qualitative research can be done by extending observations, increasing persistence in research, triangulation, discussions with colleagues, and negative case analysis [21]. In this study, researchers used a triangulation validation test, a data collection technique correlating various data collection techniques and existing data sources.

2.5. Data Analysis Techniques

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Data analysis in this research uses qualitative and quantitative descriptive analysis techniques. Qualitative data is obtained as input from validators at the validation stage and information from a team of experts. Meanwhile, quantitative data that describes the validity results of the design of the Learning Implementation Plan (RPP) for the PjBL learning model on Indonesian natural conditions. Data was obtained through assessment instruments. Data from opinions or responses to product validation tests collected through questionnaires is analyzed statistically.

3. Results

3.1. Concept of Learning Model

It is essential to carry out design trials to determine the quality of products developed in development research. The product is tested for suitability for use as a learning model. Validators carry out product evaluation, then stage I assessment is carried out. Junior high school social studies teachers re-evaluate the product; then, a stage II assessment is carried out. The product was then tested on junior high school students before it became a suitable and quality final product as a social studies learning design for the PjBL Model - Ecopedagogy for to improve environmental problems by providing knowledge to change attitudes and improve skills regarding environmental health.

Research results [24] show that students who use PjBL-based learning are more creative and active and have better learning outcomes. According to Blom, PjBL can meet learning demands by referring to the cognitive domain that will be achieved in learning and paying attention to the special characteristics of PjBL. This is because PjBL helps students learn strong and meaningful knowledge and skills. They can expand their knowledge through concrete extracurricular activities, such as open-ended planning or investigation activities, and develop their knowledge through experiences and cognitive discussions in collaborative workplaces. Therefore, creativity and learning outcomes can be improved with a PjBL model [25].

The research results [26] show that an ecopedagogy model is oriented toward meaningful multidomain student development. This means that learning must cover multiple domains—cognitive, affective, and psychomotor—not just the cognitive domain. Ecopedagogic-based education emphasizes the development of material not only limited to text but also through a contextual approach. This means that learning must be developed using sources and media in the context of students' lives to construct knowledge effectively. Thus, learning must be based on an interdisciplinary approach to increase students' overall knowledge and understanding. Additionally, environment-based education focuses on understanding the essentials of humans and nature, leading to increased critical awareness and character formation.

Research conducted (by Anggraini & Wulandari, 2021) shows that the PjBL model can influence increasing student activity in learning. This research also helps students to understand the material presented more deeply. Learning outcomes can also be affected by student activity. Students can more easily understand the material with the various activities used by the PjBL model, which prevents learning from becoming monotonous and boring [27].

The theoretical basis and relevant research results that have been described in this research there is an update that the PjBL model through learning is oriented towards the principles of Ecopedagogy; the syntax of the PjBL model is learning that involves students' activeness in solving problems, carried out in groups or independently through scientific stages with limitations. A specific time is stated for a product to be presented to others.

The initial stage of this development was carried out by collecting initial data regarding using literature studies to obtain theoretical data on learning models and previous research. Apart from that, researchers conducted field studies regarding the conditions for implementing the independent learning curriculum, students' understanding of caring for the environment, and learning models for junior high school students throughout the district. Sukoharjo. The next stage is to develop a PjBL model - Ecopedagogy- by compiling research instruments and a learning implementation plan (RPP). The final step is to implement and determine the effectiveness of the PjBL - Ecopedagogy Model for to improve environmental problems by providing knowledge to change attitudes and improve skills regarding environmental health Sukoharjo Regency.

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Expert validators validated the initial product of the learning model, and then a revision of the development of stage I was obtained. The next stage was assessment by the class IV A social studies subject teacher, correcting the stage II product. The next stage is a trial run on all Sukoharjo Middle School students, and then corrections will be obtained to improve the final product. The final product will be produced from the stages of product revision, the PjBL Model - Ecopedagogy for to improve environmental problems by providing knowledge to change attitudes and improve skills regarding environmental health in Social Studies Learning for Junior High School students.

Based on data from the recapitulation of the implementation of the independent curriculum and the 2013 curriculum for the junior high school level in the Sukoharjo district, it shows that there are 79 junior high school schools in the Sukoharjo district. Among the 79 schools, 65 have implemented the independent curriculum, but only in class VII; the rest are still implementing the 2013 curriculum. Then, the researchers want to know the actual conditions for implementing the independent learning curriculum for students' understanding of Ecopedagogy in its implementation. Researchers developed a PjBL model based on Ecopedagogy and implemented it in three Adiwiyata schools in Kab. Sukoharjo is the independent adiwiyata of SMPN 1 Grogol, the national adiwiyata of SMP Muhamadiyah 1 Kartosuro, the provincial adiwiyata of SMPN 2 Sukoharjo. Effectiveness of the Ecopedagogy-based PjBL Learning model in junior high schools throughout the District. Sukoharjo can increase that students' environmental awareness increases. Middle school schools in Sukoharjo Regency have been categorized into 2, namely, Adiwiyata schools and non-Adiwiyata schools. A list of Junior High Schools (SMP) in Sukoharjo Regency can be seen in Table 1 below.

Table 1.
Category amount of junior high schools in Sukoharjo regency.

No	School category	Amount junior high school
1.	Adiwiyata school	35 schools
2.	Non-Adiwiyata school	51 schools

3.2. Project-Based Learning Based on Ecopedagogy

Ecopedagogy emerged as a reaction to the educational practices that have been taking place in schools. Ecopedagogy is a movement in education that aims to help students develop into conscious, understanding, and capable persons who value environmental conservation [14]. Meanwhile, according to [15], EcoPedagogy is a teaching method that cultivates in students a sense of independence and autonomy, the capacity to learn from experiences outside of the classroom, and an awareness of how their actions affect the environment and oneself. Critical theory and critical pedagogy support Ecopedagogy as a learning technique [17]. This approach allows students to work independently in constructing (creating learning and quantifying it in actual products) [28]. Therefore, Ecopedagogy-based education can build critical awareness and develop students' character to understand their essence as humans who have a relationship with nature and manifest this awareness through wise behavior towards nature. Ecopedagogy as critical pedagogy has a place in the curriculum as a practice that seeks to build students' ecological intelligence and must be able to liberate them from ideological constraints that have played a significant role in accelerating the destruction of planet Earth.

The results of this research are based on interviews related to the application of the PjBL model with several social studies teachers at SMP in the Sukoharjo district; the Head of Curriculum, deputy, and head of MGMP concluded that the PjBL Model can be applied to the theme "Environmental Economic Conditions." The learning models that social studies teachers have used so far are discussion, lecture, PBL, games, and discovery learning models. Regarding the term PjBL, it is not foreign to the interviewees; they already understand the six steps of PjBL, namely (1) determining basic questions; (2) creating project designs; (3) arranging scheduling; (4) monitoring project progress; (5) assessment of results; (6) experience evaluation. According to the informants, students need to be given knowledge about environmental education so that this can be applied to learning. Based on interviews with several social studies teachers, they have occasionally used environmental education in learning; some social studies teachers apply the Ecopedagogy approach to the material, while some apply it in syntax and

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learning media. The Ecopedagogy approach is considered to be able to help achieve learning objectives in the theme material "Environmental Economic Conditions." The interviewees thought there were difficulties in the PjBL model, namely in the practical materials and syntax in the project planning design section. According to them, the PjBL syntax that had to be changed was the schedule structure, planning design, and experience evaluation. From the results of the interview, information was also obtained regarding the PjBL-Ecopedagogy learning model; if applied to the material on the theme "Environmental Economic Conditions," it has the potential to raise Pancasila's prominence in terms of religion, devotion to God Almighty, and noble character, the size of global diversity, the extent of cooperation. Cooperation, independent dimension, critical reasoning dimension, and creative dimension.

At the Paulo Freire Institute in Brazil, initiated by Gadoti, earth pedagogy, another term for Ecopedagogy, was developed by an anti-hominian and European-centric movement in education. This movement refers to pedagogy (pedagogy of liberation), which refers to Freire's thinking, the anti-capitalism and neoliberalism movement, and the move to empower local communities so they are not uprooted from their cultural roots [29]. The Ecopedagogy movement in Bulgaria is a practical action in school learning. In a New Eco-Social Civilization project, reasonable steps for educational practitioners are formulated, which can also be read by political decision-makers, environmental experts, and parents at home. The Ecopedagogy developed in this project is a kind of cooperative learning in games containing elements of cooperation and competition, which differs from the capitalist model's concept and competition (round) [30]. This Ecopedagogy project departs from the vision of building an alternative civilization as the opposite of capitalist society, which places nature and humans as assets to be controlled [29].

Critical Ecopedagogy views on environmental education, students must be empowered to have a crucial idea of sustainable development and limited natural resources, as well as the ability to adapt to an increasingly changing environment so that power is inherent in them so they do not become victims, from the hegemony of other groups. This is also relevant to the green curriculum, which can contain educational programs that prepare students with the understanding and skills to support sustainable development. The existence of a multicultural culture in the school environment. The role of social sciences provides an understanding of how good interaction between different ethnicities should be carried out by students and the school environment. The teacher and school environment are essential in building good interactions between students. The motivation given by the teacher at each lesson break about love for each other and respect provides positive thoughts for each student [31].

The development of the PjBL - Ecopedagogy model is based on several assumptions as follows: the PjBL - Ecopedagogy model design can:

1) Instill the character of caring for the environment in junior high school students.
2) Effectively implemented in social studies learning for junior high school students.

The development of this PjBL - Ecopedagogy model has limitations, including:

1) The result of this PjBL - Ecopedagogy model was designed and created for class VII middle school social studies learning on the main subject of human activities in meeting basic needs
2) Development of a PjBL - Ecopedagogy model limited to junior high schools in Sukoharjo Regency
3) The Ecopedagogy - Based Learning design model for building environmentally caring character at Sukoharjo Middle School was only reviewed by three supervising lecturers and assessed by material experts to provide input.

3.3. Student Learning Activeness

Based on research conducted on student activity in social studies learning with the PjBL - Ecopedagogy model for improve environmental health problems in the three Adiwiyata schools, student learning activity at each stage. Increasing student activity includes an active response and mastery of (critical) material, cooperation, independence, creativity, religious attitudes, environmental concern, and global diversity [32].

Table 2.

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The average student learning activeness in PjBL - ecopedagogy experiences increases each cycle.

Assessment aspects	SMPN 1 Grogol	SMP Muhamadiyah 1 Kartosuro	SMP N 2 Sukoharjo
Critical	30%	32%	40%
Cooperation	35%	31%	40%
Morals/Attitudes	40%	38%	38%
Independent	30%	30%	35%
Creativity	35%	38%	35%
Religious attitude	40%	40%	35%
Concern for the environment	40%	40%	40%
Global diversity	35%	38%	35%

Student activity can also influence their learning outcomes. The learning process will be varied and exciting for pupils to comprehend the subject matter more readily when the different exercises are implemented. The Ecopedagogy can influence growing student involvement in the learning process-PjBL learning paradigm. Additionally, this research greatly aids students in developing a deeper understanding of the material on the issue of "Environmental Economic Conditions," [33]:

1) Have faith, be devoted to God Almighty, and have noble morals (Students can appreciate the attributes of God in carrying out rituals of worship or prayer throughout life, manifest affection, care, respect, respect students for themselves, tolerant with adherents of other religions and beliefs in maintaining harmony in life, responsibility, compassion and care for the surrounding natural environment, understanding their rights and obligations as citizens, by prioritizing humanity, unity, interests and safety of the nation/state)
2) Global diversity (Students can recognize and appreciate culture, can communicate interculturally in interacting with each other, reflect and be responsible for the practice of diversity social justice)
3) Working together (students can collaborate, have a caring attitude, and are willing to share)
4) Independent (Students can understand themselves and the situations they face, self-regulation, awareness of themselves and the situations they face)
5) Critical reasoning: Students can gather and process information and ideas, assess and analyze arguments, and consider their opinions and mental processes while making decisions.
   Creative (Students can produce original ideas, original works, and actions)

4. Discussion

The literature is growing on the importance of nature and environmental education for adultsm [34]. However, enhancing environmental awareness and ecological knowledge through education alone does not guarantee environmentally-friendly action. Contemporary nature education is exploring different ways to develop awareness for change and initiate action. Such educational activities go beyond creating understanding and awareness in order to develop a sense of commitment for individual and collective action [35]. Community-based Eco-pedagogy has the potential to bring about action at individual, community and governmental levels by situating local knowledge within a critical pedagogy and social activism. CEP therefore needs to address all sections of society for a collective action: individuals, local disadvantaged communities, public institutions, the private sector, schools, governments, policy-makers, unions and international organizations.

Environmental education shapes environmentally sensitive and responsible human beings. Six main objectives promote the full development of young learners. First, to raise awareness of environmental issues among children. Second, to educate about the environment. Third, to encourage ecologically conscious behavior, enabling young people to make responsible choices. Fourth, to teach students environmental problem solving. Fifth, to encourage children to protect the environment. Finally, to promote holistic evaluation to enhance environmental understanding. Environmental education creates

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a generation of people who are aware of environmental issues and motivated to solve them, ensuring a sustainable and ecologically responsible future [36].

4.1. Dimensions of Faith, Fear of Almighty God, and Noble Character

In this study, students demonstrate their noble morals of responsibility, compassion, and care for the surrounding natural environment by utilizing critical components of morality toward nature as a part of the environment. Pandila kids understand that they are a component of the Earth's ecosystem and that each other affects them. He also understands that nature is God's creation, and it is his responsibility as a person to maintain it. This helped him understand how crucial it is to preserve the environment to keep it habitable for all living things and future generations. He refrains from mistreating or harming the environment, and he puts an end to actions that do so. Students are also constantly introspective, considering and increasing their knowledge of the effects of their efforts on the environment. This understanding serves as the foundation for him to gradually embrace an eco-friendly lifestyle and actively participate in environmental preservation [33].

The fundamental components of environmental morality are adiwiyata indicators. Regarding the environment, students represent their high moral standards of accountability, empathy, and concern for the surrounding natural environment—for policies promoting environmental sustainability. In this instance, the school's goal and vision for fostering an environmentally conscious culture, as well as its policies for establishing environmental management, improving human resource education, saving natural resources, clean and healthy lifestyle (PHBS), allocating funds for environmental activities [37].

4.2. Dimensions of Global Diversity

This study makes use of critical social justice components. Students take social justice seriously and actively work to achieve it locally, nationally, and internationally. He is confident in his ability to use wealth to advance democracy and actively contribute to the creation of a society that is inclusive, peaceful, socially just, and focused on sustainable development [33].

The fundamental components of social justice are adiwiyata indicators. Through participatory-based environmental activities, students demonstrate their concern for and active participation in realizing social justice at the local, regional, national, and global levels. In this instance, establishing cooperative activities, fostering ecological education in schools, participating in environmental action projects run by outside organizations, and designing interactive extracurricular ecological education programs are a few examples [37].

4.3. Dimensions of Critical Reasoning

This study uses the crucial component of thinking critically and assessing oneself. Students examine their thinking critically (metacognition) critically and consider the steps involved in their thought process to draw conclusions. He is conscious of how he thinks, his choices, and the growth and boundaries of his capacity for thought. This helped him recognize that he might grow in this area by thinking critically, trying to improve his tactics, and persevering in different approaches. Aside from that, he is open to altering his convictions if they are supported by the available data [33].

Key components Adiwiyata indicators serve as a reflection and assessment of an individual's thought process. Students University engage in metacognition, where they reflect on and assess their thinking. This process helps the students conclude that an ecologically centered curriculum should be developed and implemented. Creating cross-disciplinary learning models, researching and creating content on environmental challenges in the neighborhood, and creating curriculum activities to broaden students' knowledge and ecological consciousness are some ways to characterize it [37].

5. Conclusion

Based on the analysis results, it can be concluded that 84% of junior high schools in Sukoharjo Regency have implemented the Merdeka Curriculum in class VII. This curriculum provides freedom for students to develop and deliver more active opportunities for students and positively impacts both teachers and students. Renewal of the development of the PjBL model through learning oriented

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towards the principles of eco pedagogy, the syntax of the Project learning model, understanding that involves active students in solving problems, carried out in groups or independently through scientific stages with specific time limits, which are outlined in a product for further presentation to others. Based on researchers' observations, the application of the PjBL-Ecopedagogy model to junior high school students in Sukoharjo Regency has had a positive influence, namely increasing student activity, including responding, cooperation, mastery of material, conveying ideas, creativity, religious attitudes, and concern for the environment.

6. Suggestions

This research was tested at Adiwiyata schools; this research can provide direction for schools and junior high school students in Sukoharjo Regency in carrying out Ecopedagogy -based education, especially in implementing GPBLH (Cultural and Environmental Care Movement) in social studies learning. It can be a reference for social studies teachers, especially non-adiwiyata, Ecopedagogy-based learning.

Acknowledgments:

This research is the development of the PjBL - Ecopedagogy Model for improve environmental health problems in Middle Schools throughout Sukoharjo Regency as well as implementing and analyzing the effectiveness of the PjBL - Ecopedagogy Model for improve environmental health problems in Middle Schools throughout Sukoharjo Regency. The author would like to thank all parties who have provided moral and material assistance to complete this research.

Co-Author Contribution:

Our role in writing this scientific article is that Pranichayudha Rohsulina carried out fieldwork, prepared a literature review, and should have written the entire article. Dewi Liesnoor Setyowati wrote the research methodology and performed data entry. Agustinus Sugeng Priyanto and Cahyo Budi Utomo carried out data analysis and interpretation of results.

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