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Utilization of Household Waste Media in Project-Based Learning to Improve Students' Eco-literacy and Creativity

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Abstract

This research is motivated by household waste that has not been managed properly so that a learning approach is needed that is built from real student activities. This study aims to analyze whether there is an improvement in students' eco-literacy and creativity. The research method used a quasi-experimental design. The experimental group was taught using the project-based learning model that used household waste in the form of used goods media and the control group was taught using the group investigation model that used household waste media. The instruments used multiple-choice test questions on eco-literacy and test questions on students' creativity on the theme of heat and its displacement. Data collection consists of the performance test. The data analysis technique used the research prerequisite tests. Meanwihle, hypothesis testing using the average difference test and the N-gain test. The average eco-literacy ability exceeds the minimum criteria, the proportion of classical completeness is more than 75%, and the average class with the utilization of household waste based on project-based learning is better than that of the class before this lesson. It can be concluded that there is an improvement in students' eco-literacy and creativity in teaching with household waste media in project-based learning.

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INTRODUCTION

The development of science and technology, not only has an influence on the development of human resources but also has a negative impact on the surrounding environment. Unlimited forest exploitation, illegal logging, hunting of protected wild animals, and improper waste management are some of the many factors that affect the imbalance of nature. According to Jolaha et al. (2021), the selection of waste processing and household waste handling activities in the community's living environment is very useful, especially in creating a clean and healthy environment. Puspitasari & Hidayat (2022) explain that several approaches can be taken in waste management, including regulations, institutions, finance, technology, and public participation. The integration of all these pillars will make waste management more efficient.

Waste processing is important learning media because any approach, method, or strategy used in learning will not provide any benefit and meaning to improve the quality of learning as long as the use and utilization of learning media are not optimal (Sunaengseh, 2016). According to Nurlaili et al. (2018), learning using waste recycling media provides opportunities for students to care more about the surrounding environment and more easily understand the learning process in class.

One area that needs to be improved in learning about environmental awareness is natural sciences (IPA). The essence of learning Natural Sciences (IPA) prepares students to become scientists by training them to conduct new investigations of natural phenomena to discover new scientific products using scientific processes based on scientific attitudes (Subali, 2013). According to Kurnianto et al. (2019), learning science in elementary school aims to teach basic concepts about the natural environment.

In Indonesia, students who study science have not been able to apply it in real life. According to Gusdiatini et al. (2017), the Program for International Student Assessment (PISA) showed that science learning outcomes in Indonesia are low due to many factors, one of the factors is the student learning environment in the form of strategies created by teachers. The science learning process is carried out through scientific activities that provide a direct experience (Wijanarko et al., 2017). Therefore, students can solve problems and make decisions, have a positive attitude towards technology and society, and instill knowledge and understanding of science concepts. Household waste treatment is very appropriate to be used as learning media because students' problem-solving abilities can be measured through a project-based learning model. Therefore, students' Eco-literacy and creativity abilities will improve.

Eco-literacy is an acronym for ecological literacy, also known as ecological literacy, environmental literacy, ecological literacy, and environmental literacy (Putri et al., 2019). In simple terms, eco-literacy can be interpreted as understanding and practicing ecological values . As a result, Nurlaili et al. (2018) say that Eco-literacy is intelligence that comes from thinking about how nature helps all living things.

Wasino et al. (2020), citing various expert opinions, describe how Eco-literacy is very important to be integrated with educational culture, including (1) building collective awareness; (2) education that can change the paradigm of science from being mechanistic, reductionist, partial, and value-free to ecological, holistic, and bound to values, so that it can give birth to local wisdom; (3) education places more emphasis on a structuralism approach; and (4) education to know the cultural environment, both traditional and architectural. In the context of education at the elementary level, eco-literacy awareness needs to be instilled in students' mentality and spirit in caring for the environment.

Aripin & Putri (2021) revealed the fact that consuming plastic food or drinks is a bad habit for health and also has an impact on improving waste in the school environment. It shows that there is still a lack of understanding, awareness, and environmental friendliness, as well as the low level of eco-literacy and

creativity of students in utilizing materials that are no longer used. On the other hand, Kurniasari (2018) also emphasized that the low level of eco-literacy can be seen in students' indifference to the school environment, which is indicated by the behavior of many students who litter. It is a problem that must be immediately reduced by strengthening the understanding of students' eco-literacy in elementary schools.

In this case, for students in elementary school who often throw out their garbage on time, a stimulus can be given in the form of using the existing media in science learning to reduce the level of waste in the surrounding environment. Pratiwi (2016) describes proper management and management as a solution to educating students on waste. One alternative that can be used is using learning media in waste management. Research conducted by Sariyyah (2019) describes managing paper waste in various kinds of crafts as a form of recycling activity. Sumarni (2016) explains the concept of a project-based learning model as carried out individually or in groups within a certain period to produce a product, then the results are displayed or presented. Besides, project-based learning is a type of learning that takes place in a real-world setting, where students play a role in solving problems, making decisions, researching, presenting, and creating documents. Rahmawati (2019) confirms that the project-based learning model can increase understanding of eco-literacy through the assignment of eco-bricks in utilizing plastic waste so that the level of awareness and concern for the school environment is optimal. It means that the media for processing waste or household waste based on project-based learning can improve students' Eco-literacy and creativity in waste processing.

According to Bernadi (2017), creativity is a new production process of all existing elements by arranging them in a new configuration. Everyone's creativity is different, but that does not mean you do not have creativity. The implementation of this creativity variable requires encouragement, motivation, and the ability to convey critical thoughts. Motivation can be realized with desire, high enthusiasm for learning, and support from teachers or parents (Kurnianto & Rahmawati, 2019). Meanwhile, critical thoughts arise from an idea or an idea from the communication process. In communication, there is a strategy to have interesting ideas and creativity that stand out when conveying goals (Kurnianto, 2021).

Taupik et al. (2018) explain that the implementation of the project-based learning model has been shown to have a considerable influence on students' higher-order thinking skills and creativity. Astuti & Aziz (2019) analyze Parnes' statement that creativity is not a potential that is born. It means that creativity is not solely from the individual but also the individual and the environment. Furthermore, Kusumawardani (2015) says that the development of creativity should start early on children creative become creative adults who can solve many different kinds of problems in their own lives.

In this case, students at SDN Ngemplak Kidul used media from household waste in the environment around their residence and school. To find ideas and concepts that are related to the theme of learning about their environment by cleaning up their surroundings and making media from waste, students need to be thinkers and processors. They use the project-based learning model to turn their thinking into media that can be understood. Besides, teachers often use the group investigation learning model in the teaching and learning process and even barely use learning media at all, so students quickly feel bored in the learning process. This means that, ultimately, learning is not absorbed optimally.

According to Taupik & Fitria (2018), the project-based learning model is one of the innovative learning models that actively involves students in constructing their knowledge independently with the mediation of their peers in groups to complete projects that have been designed by the teacher.

The purpose of this study is to analyze the use of household waste media in science learning based on project-based learning to improve students' Eco-literacy and creativity.

METHODS

This type of research is quantitative research. This study used a quasi-experimental design with the Non-equivalent control group design model. Before being given treatment, both the experimental group and the control group were given a test, namely the pre-test. Then, after being given treatment, the experimental group and the control group were given a test, namely the post-test. It is to determine the condition of the group after treatment. In the experimental group, the learning is carried out using a project-based learning model using household waste in the form of media that can still be used, which is contained in the discussion of students' thematic books on science learning theme 6, sub-theme 1, namely heat and its transfer. While in the control group, learning is carried out using the group investigation learning model using household waste media. The stages of learning with the project based learning model are presented in Figure 1.

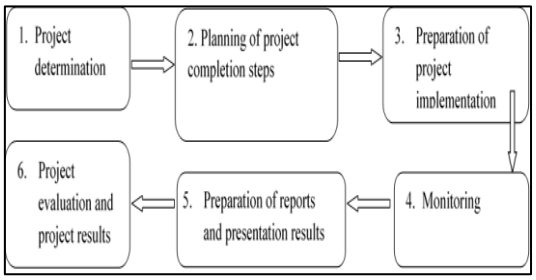


Figure 1. Project-Based Learning Model Syntax

Figure 1 shows the first level is Project Determination. Students determine the topic of the project given by the teacher and are given the opportunity to choose the project they will work on. The second level is planning the project completion steps. Students design the steps of project completion activities from start to finish and their management. the teacher's role is to facilitate activities, such as supporting project assignments. The third level is the preparation of the project implementation schedule. Through teacher assistance, students can schedule all the activities they have designed. How long the project must be completed step by step. The fourth level is monitoring by the teacher. This step is the implementation step of the project design that has been made. Activities that can be carried out in project activities include (a) reading, (b) researching, (c) observation, (d) interviews, (e) recording, (f) creating art, (g) visiting project objects. Teachers are required to monitor the activities of students in carrying out project tasks. Enter at level 5, namely the preparation of reports and presentation results. The results of the project are in the form of products that are presented by students and teachers in the form of exhibitions/learning presentations. The last level (Level 6) is project evaluation. teachers and students at the end of the learning process reflect on the activities and results of project assignments. At the evaluation stage, students are given the opportunity to express their experiences while completing project assignments. At this stage, feedback is also carried out on the processes and products that have been produced.

This study used a non-probability sampling technique with a purposive sampling type, which is a sampling technique with certain considerations. The selection of the sample group took several things into account, as follows: (1) the number of students, (2) the qualifications of classroom teachers, (3) the school accreditation, and (4) the school status. The samples were 20 students at SDN Ngemplak Kidul class V and 20 children at SDN Tanjungrejo. Therefore, the total sample size is 40 students. The grouping of research samples is briefly presented in Table 1

.

Table 1. Distribution of Research Sample

No	School	Number of Class V	Description
1.	SDN Ngemplak Kidul	20 students	Eksperimental Group
2.	SDN Tanjungrejo	20 students	Control Group
Total		40 students	

This research has four variables. Two independent variables are household waste media (X1) and project-based learning (X2). Furthermore, there are two dependent variables: Eco-literacy (Y1) and creative thinking (Y2). Data collection techniques used include questionnaires, tests, documentation, and observation. The data analysis technique used the research prerequisite test which included the normality test, used to determine the normality distribution of the data and the homogeneity test, aiming to determine whether the experimental class and control class had the same variance or not. Meanwhile, the hypothesis test includes descriptive statistical tests, to describe and provide an overview of the frequency distribution in each class and the average difference test, to determine the difference in the average scores in the control and experimental classes.

RESULTS AND DISCUSSION

The results of this study showed the testing hypothesis. Besides, the discussion examines the meaning of the research findings. The results of the study are described in the form of data analysis prerequisite tests and research data. In this study, the analysis prerequisite tests are the normality test and data homogeneity. The data tested for normality and homogeneity is the students' post-test.

The normality test was used to determine the normality of students' Eco-literacy and creativity. It is used to determine the normality of the experimental group and the control group. The normality test in this study used the One-Sample Kolmogorov-Smirnov Test. The results of the normality test are presented in Table 2.

Table 2. The Normality Test of Experimental and Control Groups' Eco-literacy

Group	N	Kolmogorov-Smirnov Z	Sig.	Exp
Experimental Group	20	.923	.361	Normal
Control Group	20	.784	.571	Normal

Table 3. The Normality Test of Experiment and Control Groups' Creativity

Group	N	Kolmogorov-Smirnov Z	Sig.	Exp
Experimental Group	20	.980	0.292	Normal
Control Group	20	.855	0.458	Normal

Based on Table 3, the results of students' creativity can be seen to be normally distributed if the significance value (sig) in the column is greater than 0.05. This means that creativity data comes from a population that is normally distributed.

The homogeneity test of the data can be done using the Levene test using SPSS version 20. The results of the homogeneity test pre-test can be seen in tables 4 and 5.

Table 4. The Homogeneity Test of Eco-literacy

Data	Levene Statistic	df1	df2	Sig.
Pretest Eco-literacy	0.183	1	38	0.712

Based on table 4, it can be seen whether the data is homogeneous or not by comparing the significance values with a significance level of 0.05. If the significance value is greater than 0.05, it means that the data is not homogeneous. Because the significance value of the data that has been tested is 0.712, it means 0.712 > 0.05.

Table 5. The Homogeneity Test of Creativity

Data	Levene Statistic	df1	df2	Sig.
Pretest Creativity	0.895	1	38	0.350

Based on the information presented in Table 5, it can be seen through testing using Levene. It is obtained a sig value > 0.05 in each pre-test data set on students' creativity. Therefore, it can be concluded that the students' creativity pretest data that has been tested in the experimental group and control group is 0.350, namely Ho is accepted. It means that the data from the two sample classes are homogeneous (there is no difference in variance).

1.The Utilization of Household Waste Media in Project-Based Learning to Improve Students' Eco-Literacy Ability

This study shows that learning using a project-based learning model and household waste media can improve students' eco-literacy abilities. This data was obtained from test scores before and after learning with a project-based learning model using household waste media. The utilization of household waste media in a project-based learning model was measured using an independent sample t-test. The researcher used the SPSS version 20 program.

Besides, this study provides science learning in both groups with the same material and learning media but with different learning models. Students in the control group were given material

using the group investigation learning model, while the experimental group was given material using a project-based learning model using household waste media.

The teaching and learning process is based on the lesson plans that are contained in the appendix. Both the control group and the experimental groups were given post-test questions. The scores of students at the post-test stage were compared to determine whether there was a significant difference in the post-test scores of the experimental group and the control group. By using an independent t-test, the mean scores of students in the experimental group and control group proved to be significantly different. The average value of the experimental group is 82.00, which is higher than the posttest value of the control group of 76.75. It shows that the project-based learning model using household waste media is more effective in increasing students' eco-literacy abilities compared to the group investigation learning model. It is also supported by the results of the average gain score for the experimental group and control group, which shows an improvement in the project-based learning model using household waste media in learning activities.

Learning on the theme of heat and the transfer of heat in science subjects by applying a project-based learning model using household waste media can improve eco-literacy abilities. Students can learn in groups by solving problems to complete tasks in the form of household waste media, so students tend to be more compact and enthusiastic in their learning. A project-based learning model is a form of learning that is described from beginning to end and is presented specifically by the teacher, including approaches, strategies, methods, techniques, and even learning tactics that have been strung together into a unified whole. Students pay full attention to the teacher's instruction. Students are very happy when they are grouped to discuss new material.

The project-based learning (PjBL) model creates activities to obtain information and develop science concepts. Students learn about how to build a problem framework, observe, collect data, organize problems, compile facts, analyze data, and develop arguments related to problem-solving, both individually and in groups. Create works or products, and reports, and present them in groups as a type of work or project (Nugraha, 2015). With these activities, the project-based learning model is liked by students, so students are more motivated to participate in the learning process. Students are the focus of this model, and they are asked to be active in the teaching and learning process by being given a problem to work on.

According to Ismuwardani et al. (2019), the project-based learning model is an appropriate model to be used in the learning process of students' activities and provides the freedom to develop their potential.

The learning experiences of students during the implementation of the project-based learning model that has been obtained include: students should care about problems in the surrounding environment in their daily lives; practice being sensitive to the environment; learn to look for essential questions; students should practice thinking logically, critically, and in detail. Then, students think about how to connect one thing to another thing, how to think about the time sequence, how to divide tasks based on the interests and abilities of students, how to find information and knowledge, and how to work together and learn from their mistakes. Students also try to work according to their understanding, talk with each other, work together, and learn from mistakes.

According to Sutirman (2013), project-based learning is a learning model to produce real products or projects in which students play an active role. Thus, project-based learning that pays great attention to the systematic work process in making useful real work is very suitable to be applied in education, even from the elementary school to the high school level. Students who get the PjBL approach are better than students who get group investigation learning.

An independent sample t-test was used to compare students' eco-literacy and creativity

between the control group and the experimental group. A further test was held to determine the higher average score of students' creativity learning outcomes. It was held by looking at the average value of the two groups being compared, which is presented in Table 6.

Table 6. The average of the eco-literacy pretest and posttest

Variable		Group	Mean	Std Deviation
Eco-literacy	pretest	control	55.5	15.21
		experimental	50.75	15.67
	posttest	control	71.25	11.46
		experimental	79.5	11.69

The average post-test eco-literacy learning outcome for the experimental group was 79.5 and for the control group was 71.25. It can be concluded that the experimental group of eco-literacy learning outcomes was better than the control group. Based on the results of the independent sample t-test, the results of the calculations are shown in Table 7.

Table 7. Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	T	df
posttest	Equal variances assumed	.154	.697	-2.254
	Equal variances not assumed			-2.254

Based on the analysis of the results, the significance value between the control group and the experimental group on the post-test eco-literacy data was 0.03 < 0.05. This indicates that there is a significant difference in the average eco-literacy learning outcomes of the experimental group and the control group after being given treatment. Figure 2 shows how project-based learning improves students' creativity scores. Each of the indicators shown in the figure has risen.

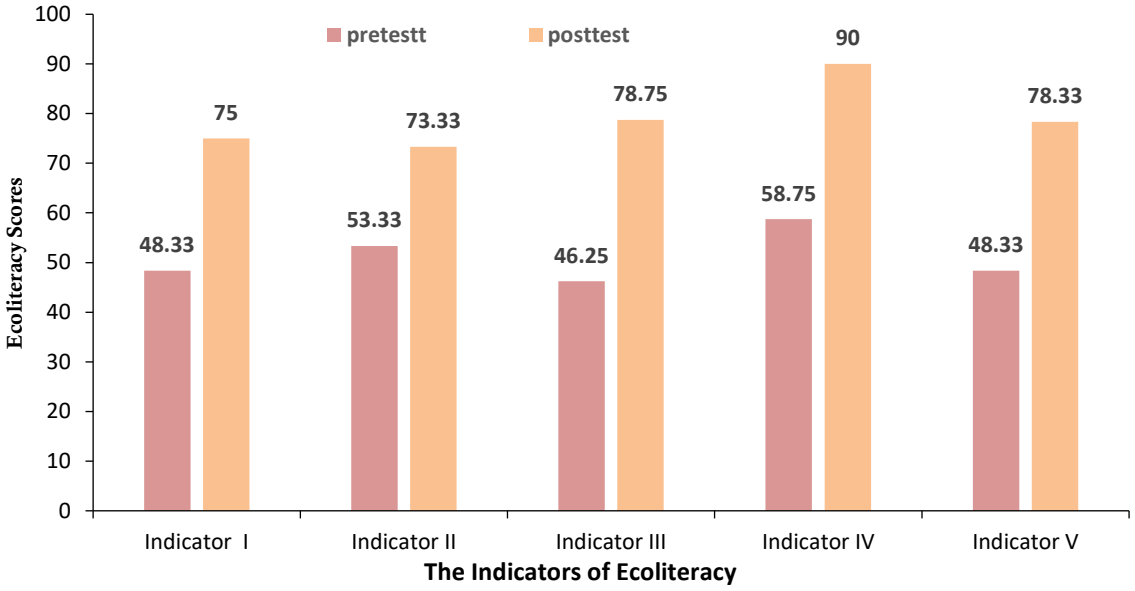


Figure 2. Average indicators of eco-literacy

Indicator Description:

I: developing empathy

II: embracing resilience

III: making visible

IV: anticipating bad consequences

V: life support tools

Based on Figure 2, there is an improvement score from pretest to posttest for each indicator of student eco-literacy. an improvement in the indicator of developing empathy by 75%, embracing resilience by 73.33%, creating the invisible by 78.75%, anticipating bad consequences by 90.00%, and life support tools by 78.33%.

This study has proven that the project-based learning model impacts students' creativity. It shows that students' flexibility is the most influential indicator. In line with Utami et al. (2018) research, they carried out in grade 3 at *SD Negeri Manggihan, Getasan*, *Semarang*, there was an improvement in students' creativity and learning outcomes in learning activities in cycle I and cycle II in the application of the Project-Based Learning model. Sari & Siska (2018) showed that the project-based learning model has enormous potential to make the experience more interesting and useful for students. In this project-based learning, the active participation of students in making a project is the most important thing.

Therefore, it can be seen from the rise in learning creativity from pre-cycle to cycle II that students can participate well in learning activities and that learning outcomes get better in each cycle, as well.

2.The utilization of Household Waste Media in Project-Based Learning to Improve Students' Creativity Ability

The use of household waste media based on the project-based learning model was measured using an independent sample t-test with the SPSS version 20 program. The independent sample t-test was used to compare students' eco-literacy and creativity between the control group and the experimental group. In project-based learning, students are given problems to find a solution to, and the findings are knowledge related to the material that has been taught. The use of household waste in the project-based learning model can improve

students' understanding of the science material. It is obtained by designing a map of the students' thinking. A further test was conducted to determine the higher average score of students' learning outcomes in eco-literacy and creativity. It is to figure out the average value of the two groups being compared, which is shown in Table 8.

Table 8. The average of creativity

variable		group	Mean	Std Deviation
Creativity	Pre	control	54	12.52
		experimental	52.25	15.85
	Post	control	68.75	9.85
		experimental	82	9.78

Based on the paired sample t-test in Table 8, students' creativity can be seen to have a significance value is 0.000 < 0.05. It indicates that there is a significant difference in the average creativity of the experimental group compared with the control group after treatment. Therefore, there is an improvement in creativity scores before and after learning. In other words, there is an effect of the implementation of the project-based learning model on students' creativity. Students' creativity develops by being given learning that gives them the freedom to use their methods to obtain information in learning. Figure 3 shows how project-based learning improves students' creativity scores. It can be seen from each of the indicators.

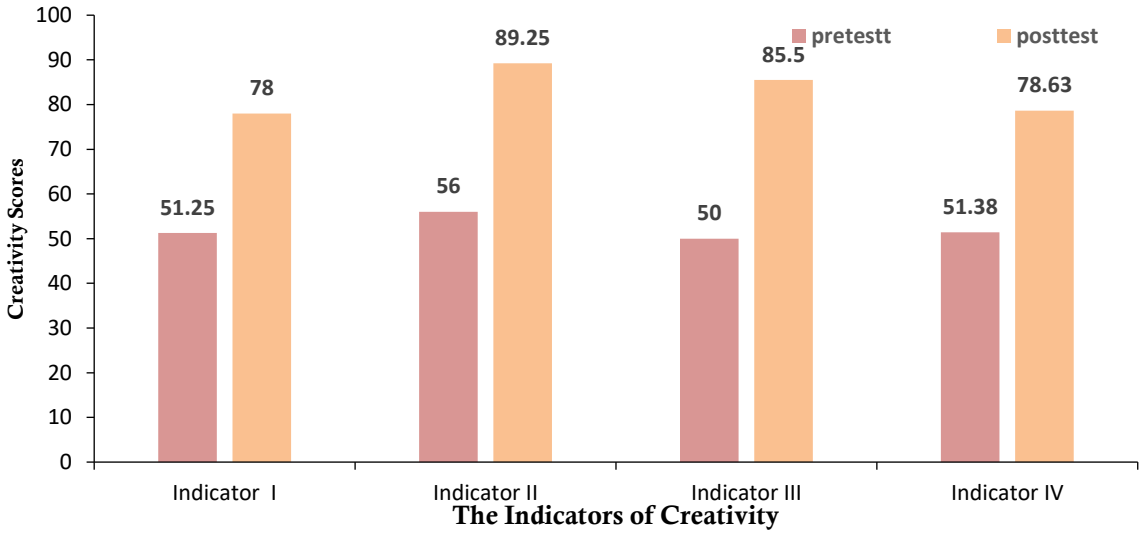


Figure 3. An improvement in students' creativity scores

Indicator Description:

I: Fluency

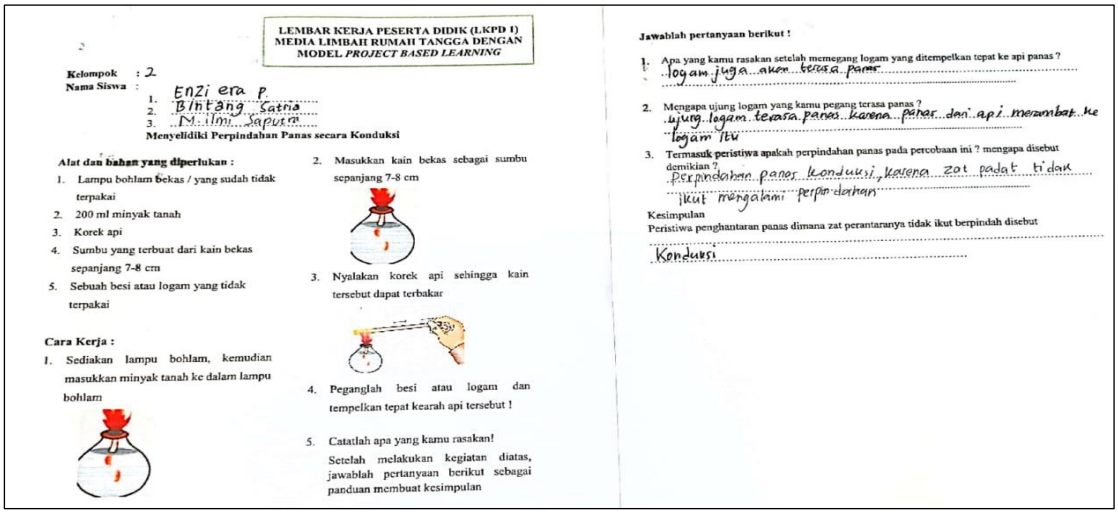
II: Flexibility

III: Authenticity

IV: Details

Based on the visualization, Figure 3 shows that for each indicator of students' creativity, there is an increase in scores from pretest to posttest. An improvement in the fluency indicator by 78%, the flexibility indicator by 89.25%, the authenticity indicator by 85.5%, and the detailed indicator by 78.63.

Rusmawan (2017) argues that people who have reached the level of eco-literacy are very aware that the environment is important. The step of project-based learning consists of determining the project, planning the steps for project completion, compiling a project implementation schedule, monitoring by educators, preparing reports and presentation results, and evaluating project processes and results (Hosnan, 2016). These steps invite students to actively participate in making a project. It is the main thing to learn in connection with everyday experiences. Students will feel motivated to learn more. as shown in Figure 4a and 4b.



LEMBAR KERJA PESERTA DIDIK (LKPD 1)
MEDIA LIMBAH RUMAH TANGGA DENGAN
MODEL *PROJECT BASED LEARNING*

Kelompok : 2
Nama Siswa :
1. Enzi era P.
2. Bintang Satria
3. M. ilmi Saputra

Menyelidiki Perpindahan Panas secara Konduksi

Alat dan bahan yang diperlukan :
1. Lampu bohlam bekas / yang sudah tidak terpakai
2. 200 ml minyak tanah
3. Korek api
4. Sumbu yang terbuat dari kain bekas sepanjang 7-8 cm
5. Sebuah besi atau logam yang tidak terpakai

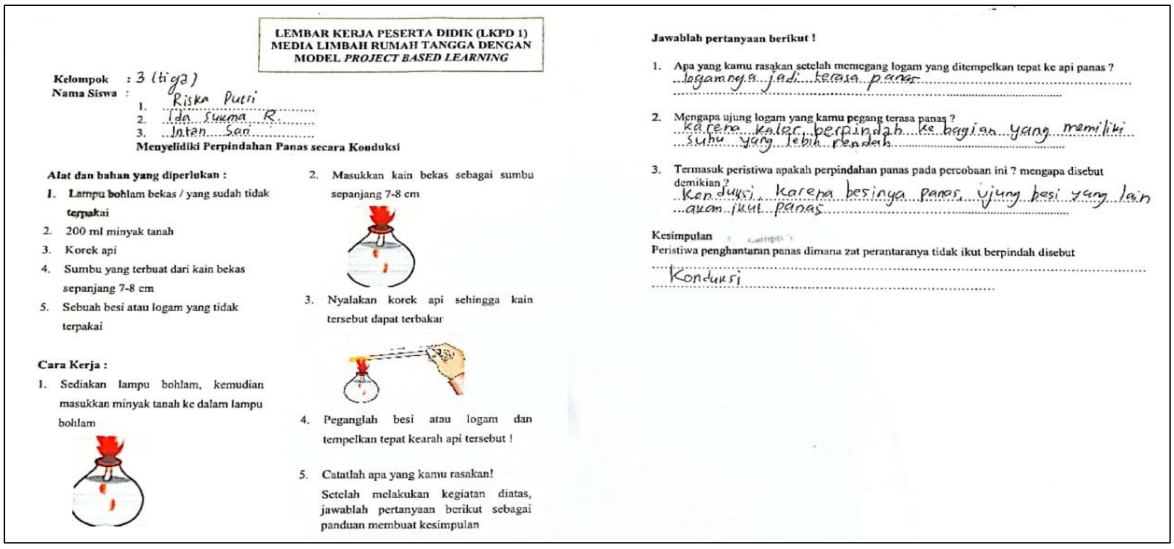
Cara Kerja :
1. Sediakan lampu bohlam, kemudian masukkan minyak tanah ke dalam lampu bohlam
2. Masukkan kain bekas sebagai sumbu sepanjang 7-8 cm
3. Nyalakan korek api sehingga kain tersebut dapat terbakar
4. Peganglah besi atau logam dan tempelkan tepat kearah api tersebut !
5. Catatlah apa yang kamu rasakan!
   Setelah melakukan kegiatan diatas, jawablah pertanyaan berikut sebagai panduan membuat kesimpulan

Jawablah pertanyaan berikut !

1. Apa yang kamu rasakan setelah memegang logam yang ditempelkan tepat ke api panas ?
   logam juga akan terasa panas
2. Mengapa ujung logam yang kamu pegang terasa panas ?
   ujung logam terasa panas karena panas dari api merambat ke logam itu
3. Termasuk peristiwa apakah perpindahan panas pada percobaan ini ? mengapa disebut demikian ?
   perpindahan panas konduksi, karena zat padat tidak ikut mengalami perpindahan

Kesimpulan
Peristiwa penghantaran panas dimana zat perantaranya tidak ikut berpindah disebut
Konduksi

Figure 4a. Student Worksheet 1



LEMBAR KERJA PESERTA DIDIK (LKPD 1)
MEDIA LIMBAH RUMAH TANGGA DENGAN
MODEL *PROJECT BASED LEARNING*

Kelompok : 3 (tiga)
Nama Siswa :
1. Riska Putri
2. Ida Fiona R
3. Intan Sari

Menyelidiki Perpindahan Panas secara Konduksi

Alat dan bahan yang diperlukan :
1. Lampu bohlam bekas / yang sudah tidak terpakai
2. 200 ml minyak tanah
3. Korek api
4. Sumbu yang terbuat dari kain bekas sepanjang 7-8 cm
5. Sebuah besi atau logam yang tidak terpakai

Cara Kerja :
1. Sediakan lampu bohlam, kemudian masukkan minyak tanah ke dalam lampu bohlam
2. Masukkan kain bekas sebagai sumbu sepanjang 7-8 cm
3. Nyalakan korek api sehingga kain tersebut dapat terbakar
4. Peganglah besi atau logam dan tempelkan tepat kearah api tersebut !
5. Catatlah apa yang kamu rasakan!
   Setelah melakukan kegiatan diatas, jawablah pertanyaan berikut sebagai panduan membuat kesimpulan

Jawablah pertanyaan berikut !

1. Apa yang kamu rasakan setelah memegang logam yang ditempelkan tepat ke api panas ?
   logamnya jadi terasa panas
2. Mengapa ujung logam yang kamu pegang terasa panas ?
   karena kalor berpindah ke bagian yang memiliki suhu yang lebih rendah
3. Termasuk peristiwa apakah perpindahan panas pada percobaan ini ? mengapa disebut demikian ?
   Konduksi, karena besinya panas, ujung besi yang lain akan ikut panas

Kesimpulan
Peristiwa penghantaran panas dimana zat perantaranya tidak ikut berpindah disebut
Konduksi

Figure 4b. Student Worksheet

Based on the student worksheets in Figures 4a and 4b, the aspects of creativity achieved by students include: 1) Fluency in answering questions on student worksheets is quite significant, indicated by the level of understanding of the learning material, 2) Students' flexibility is very high, they freely play a role in heat transfer material practicum. 3) Students deserve appreciation for authenticity in carrying out practicum with the support of a project based learning model, and 4) Students are very detailed in carrying out the practicum. Step by step is passed by connecting facts and

concepts so that they are able to find real generalizations and conclusions.

Students' creativity can develop when students are given learning that makes them free to use their way of obtaining information in learning. Students' creativity can be developed by utilizing household waste and using a project-based learning model in the teaching and learning process. Mappapoleonro (2019) concludes that the characteristics of natural creativity include being imaginative, happy to explore the environment, asking a lot of questions, always being curious, liking to do experiments, being open to new stimuli, being motivated to do various things, and wanting to get new experiences.

This is evidenced by research conducted in an experimental group using household waste combined with a project-based learning model, where students were involved in preparing the project implementation schedule, monitoring by educators, preparing reports and presentation results, and evaluating project processes and results when participating in lessons. These activities made the experimental group easily absorb the material presented by the teacher. Therefore, it is more durable in students' memories. Meanwhile, in the control group using the group investigation model by utilizing household waste, it was stated that students were less involved effectively, only through communication without acting to solve problems. Students were only recipients of ideas from the teacher, indicating that student creativity was not well trained.

CONCLUSION

Based on the results of a study conducted by a researcher on fifth-grade students at *SDN Tanjungrejo* and *SDN Ngemplak Kidul*, it can be concluded that the implementation of project-based learning can improve students' Eco-literacy and creativity. It can be proven in the results of tests and students' observations after learning by using the project-based learning model, which has increased. The results show that (1) project-based learning is effective to improve students' eco-literacy abilities and (2) project-based learning is effective to improve students' creativity. The significance value of the pretest and posttest in the control and experimental groups is 0.000 < 0.005. It means that there is an improvement in the students' Eco-literacy and creativity scores between before and after treatment

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