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The Effects of Problem-Based Learning Model with Environmental Literacy-Oriented on the Elementary School Students' Narrative Writing Skills

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Abstract

This research aimed to determine the effects of a problem-based learning model with environmental literacy-oriented on the elementary school students' narrative writing skills. Using the quasi-experimental method, this research employed a non-equivalent control group design. The research participants were 50 fifth-grade students of Islamic Elementary School (MI) Darul Qirom, consisting of 25 students in the experimental class and 25 students in the control class. The data were collected using a test instrument consisting of five questions about writing narratives. The data were then analyzed using the independent sampel t-test with the assistance of the SPSS application. The data analysis showed a significant difference between the class that used the problem-based learning model with environmental literacy-oriented and the class that used the conventional learning model, with a significant value (2-tailed) of $0.006 < 0.05$. In this study, the average post-test score for the experimental class after the treatment was 5.52 higher than the control class ($78.2 > 72.68$). It can be concluded that the environmental literacy-oriented problem-based learning model has a significant effect on the narrative writing skills of elementary school students.

Keywords: *problem-based learning, environmental literacy, writing skill.*

Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh *problem-based learning* berorientasi literasi lingkungan terhadap keterampilan menulis narasi siswa sekolah dasar. Dengan menggunakan metode kuasi eksperimen, penelitian ini menggunakan *non-equivalent control group design*. Partisipan penelitian ini adalah 50 siswa kelas V MI Darul Qirom, terdiri dari 25 siswa kelas eksperimen dan 25 siswa kelas kontrol. Data diambil melalui instrumen tes yang terdiri dari lima soal uraian tentang menulis narasi. Data yang diperoleh kemudian dianalisis menggunakan uji t dengan bantuan aplikasi SPSS. Analisis data menunjukkan adanya perbedaan yang signifikan antara kelas yang menggunakan model pembelajaran *problem-based learning* berorientasi literasi lingkungan dengan kelas yang menggunakan model pembelajaran konvensional, dengan nilai signifikansi (2 tailed) sebesar $0,006 < 0,05$. Pada penelitian ini, nilai rata-rata post-test kelas eksperimen setelah diberikan perlakuan menjadi 5,52 lebih tinggi dibanding kelas kontrol ($78,2 > 72,68$). Dapat disimpulkan bahwa model *problem-based learning* berorientasi literasi lingkungan berpengaruh signifikan terhadap keterampilan menulis narasi siswa sekolah dasar.

Kata kunci: *problem-based learning, literasi lingkungan, keterampilan menulis.*

INTRODUCTION

Language is a crucial component in human life. Language serves as a means of communication between individuals in the life of the nation and state. Indonesia, renowned for its diversity, has one unified language, namely Indonesian. Given the importance of the Indonesian language, starting from an early age, the language has been taught through Indonesian language subjects in schools from primary to higher education.

Indonesian language learning is a vehicle to enhance the students' abilities to communicate correctly using this language both orally and in writing, as well as to foster an appreciation of Indonesian literary works (Farhrohman, 2017; Wati & Sudigdo, 2019; Hidayah, 2015). There are four skills in language learning, namely listening, reading, speaking, and writing (Karataş & Tuncer, 2020; Nikam, 2021; Lestari et al., 2022). These four skills are critical for students to learn from an early age. Writing skills are productive skills involving various abilities to produce a written work through various processes, both fiction and non-fiction (Kim, et al., 2021; Narsa, 2021). Writing can also be used as a guide to assist students in awakening their memories and knowledge. Writing skills are critical to be mastered by students to support their success in learning.

Language learning is important for developing literacy since the level of literacy scores of Indonesian students in PISA (The Program for International Student Assessment) from 2009 to 2018 was still relatively low (OECD, 2010, 2016, 2019). The average score obtained by the Indonesian students after participating in the PISA assessments 386. It indicates that the level of Indonesian students was still at number 3. Meanwhile, other countries have been

at levels 4 to 6 (Binasdevi, 2021; Effendi et al., 2021; Widayanti & Kolbi, 2018; Wijaya, 2017). Language literacy was related to the students' skills in listening, reading, speaking, and writing analytically and critically.

Based on the initial observations made by researchers in the fifth grade of MI Darul Qirom, it was found that the students' learning outcomes in writing narrative texts had not reached the desired standard. The pre-test results showed that the mean score obtained by students in writing narratives was 62.8 with 63% completeness in the experimental class and 63.5 in the control class with 44% completeness. It meant that only eight students of 50 students from the experimental class and 11 from the control class could complete the pre-test.

In addition to this, the obstacle was the teachers' lack of learning innovation in learning to write narratives, so that the students' interest in writing was still relatively low (Arista & Putra, 2019; Sari et al., 2020). Seeing these conditions, researchers were encouraged to do quasi-experimental research by trying to help students who had difficulty writing narrative materials. One of the solutions offered by the researchers was the application of the Problem-Based Learning model with the environmental literacy-oriented.

The problem-based learning model is to solve a problem, so the authentic or real investigation is needed to encourage students to learn through the principles and concepts they have found (Fitri et al., 2020; Ramlawati et al., 2017; Ali, 2019). The application of the problem-based learning model is believed to increase the students' activities in the teaching and learning process. By applying this model, students can actively solve problems related to their social environment (Adiwiguna et al., 2019; Kurniawan et al., 2019; Wosinski et al., 2018).

In this problem-based learning model, the students' learning is related to the surrounding environment. Students are expected to understand any problems related to their environment and try to find solutions to solve these problems. Problem-based learning is centered on a goal meaningful to students and continuous with the student life; it makes students interact with the environment (Phungsuk et al., 2017; Suryawati et al., 2020; Tarigan, 2018). This condition demands that students learn to write narratives using a problem-based learning model oriented toward environmental literacy.

The student's ability to read and understand the surrounding environment is closely related to their environmental literacy skills. Environmental literacy education must be instilled from an early age, especially in the formal education. Environmental literacy is a conscious attitude to keep the environment in balance (Liang et al., 2018; Maesaroh et al.,

2021). Students having environmental literacy attitude possess knowledge of the environment, have responsive attitude, and can provide solutions to environmental issues. Students who are prepared as the next generation and agents of change in society need to be equipped with environmental literacy skills.

Several studies have examined the application of problem-based learning models on the students' writing skills. Fitria et al. (2018) examined the effect of the application of problem-based learning models on students' news writing skills. The results of the study revealed that the use of problem-based learning models impacted on the students' writing skills as evidenced by the results of the independent sample t-test, namely $t_{\text{count}} > t_{\text{table}}$ ($2.87 > 1.68$). A study conducted by Kristyanawati et al. (2019) investigating exposition text writing skills using problem-based learning models found that there was an increase in student activities from the first cycle by 43.75%, the second cycle by 68.75%, and the third cycle by 100% after applying the model. Similarly, Kusrianti and Suharto (2019), in their research on the effect of problem-based learning on the students' poetry writing skills, found that the application of the problem-based learning model was able to improve the students' poetry writing skills, starting from 71.88% in the first cycle to 87.50% in the second cycle. In another study, the results of the independent t-test where the t_{count} was greater than t_{table} ($2.33 > 2.02$) showed that the problem based learning model affected the students' poetry writing skills (Wijaya & Fikri, 2019).

Different with the research above, the researchers use a problem-based learning model that focuses on improving the students' narrative writing skills with an environmental literacy orientation. Through this environmental literacy-oriented Problem-Based Learning model, students are expected to be able to analyze and criticize the surrounding environment to produce written works, indicating that their narrative writing skills are improving.

METHODS

The research method was quasi-experimental, and the research design was a non-equivalent control class design. An overview of the research design carried out is presented in Table 1. The population in this study were students of MI Darul Qirom. The school was located in Bandung Regency, West Java. The research sample consisted of fifth-grade students of MI Darul Qirom who were selected by applying a problem-based learning model in the experimental class and conventional learning in the control class. The number of students in the experimental class was 25 people, and in the control class was 25 people. Grade 5 was chosen because it was adapted to the students' reasoning ability in high grades.

The sampling technique used cluster sampling. All fifth graders at MI Darul Qirom were considered to have equal opportunities, so it was expected that it would illustrate students' narrative writing skills.

Table 1. A Class Research Design

Class	Post-Test	Treatment	Pre-Test
Experiment	O1	X	O2
Control	O1	—	O2

Description:

X: Class with a problem-based learning model

_ : Class with a conventional learning model

O1: Pre-test to measure environmental literacy

O2: Post-test to measure environmental literacy

As shown in Table 1, the research was carried out in two classes, namely class A as the experimental class and class B as the control class. In the experimental class, the treatment was given through a problem-based learning model in the teaching and learning process to write narratives. In class B, the students used the conventional learning model as usual.

Observations and tests were used to collect the data. The observation instrument was used to see how the problem-based learning model was oriented toward environmental literacy. Meanwhile, the test instrument was used to see the students' narrative writing skills. The test instrument consists of 5 essay questions that represent the indicators of the students' narrative writing skills, namely 1) expanding knowledge, 2) telling events chronologically, and 3) informative language. Each item was given a minimum score of 0 and a maximum score of 20. Each answer would be added up and became a score in the students' narrative writing skill variable, which was 0 – 100. After being collected, the data were analyzed using an independent sample t-test which was first tested for normality and homogeneity of with the help of SPSS version 16 software. The test criterion is H_0 was rejected if the value was significant (2-tailed) < 0.05 , whereas if the value was significant (2-tailed) > 0.05 then H_0 was accepted.

RESULTS AND DISCUSSION

In this research, the experimental and control classes were first given pre-test questions at the beginning of the lesson. It then continued with the implementation of learning based on the lesson plan that had been designed. A problem-based learning model with environmental literacy-oriented was used in the experimental class. Meanwhile, the control class still used conventional learning. At the end of the lesson, the students were given a post-test to determine the development their narrative writing skills.

The results of research on students' narrative writing skills are presented in the following table:

Table 2. Results of Students' Narrative Writing Skills

No.	Statistics	Narrative Writing Skills			
		Control Class		Experimental Class	
		Pre-Test	Post-Test	Pre-Test	Post-Test
1	Average	63.52	72.68	62.8	78.2
2	Max Score	79	89	74	90
3	Min Score	52	60	50	66
4	Standard Deviation	7.600	6.081	6.083	7.544
5	Variance	57.76	36.98	37.00	56.92

Based on Table 2, the mean of students' narrative writing skills after learning with the environmental literacy-oriented problem-based learning model (experimental class) was 78.2, with a variance of 56.92 and a standard deviation of 7.544. Meanwhile, the mean of students' narrative writing skills with conventional learning (control class) was 72.68 with a variance of 36.98 and a standard deviation of 6.08. The value of variance and standard deviation of the experimental class data was greater than that of the control class, indicating that the data values obtained in the experimental class were more varied and the data distribution was wider than that of the control class. The calculation of the research data analysis showed that the students' narrative writing skills in the experimental class, the students who learned using the environmental literacy-oriented problem-based learning model, had a higher score than the control class who took conventional learning ($78.2 > 72.68$).

After the post-test data was obtained, the data were analyzed using statistics through normality, homogeneity, and hypothesis testing stages. The normality test results for the control class obtained a significant value of 0.200. It showed a significant value of > 0.05 , which meant that the data on the results of the students' narrative writing skills in the control class was normally distributed. Meanwhile, the results of the normality test of the experimental class obtained a significant value of 0.127. It showed that a significant value of > 0.05 , which meant that the data on the results of the students' narrative writing skills in the experimental class were normally distributed. In this research, the significance score of the homogeneity test of the experimental class was 0.083. It showed a significant value of > 0.05 , which meant that the class data had a homogeneous variance.

The hypothesis tested in this research was that there was no significant difference in the narrative writing skills of school students between a group of students who used the environmental literacy-oriented problem-based learning model and a group of students who used conventional learning in the fifth grade of MI Darul Qirom. The test criteria were that H_0

was rejected if the score was significant (2-tailed) < 0.05 , whereas if the score was significant (2-tailed) > 0.05 , then H_0 was accepted. The summary of the results of independent sample t-test analysis is presented in the following table.

Table 3. Summary of Independent Sample t-Test Results

No.	Sample Group	N	\bar{x}	Significant Value (2-tailed)	Description
1	Experiment	25	78,2	0.006	H_0 was rejected
2	Control	25	72,68		

Based on the data in table 3, the post-test average value of the experimental class was greater than the control class after the stimulus or problem-based learning treatment was given to the experimental class. Then, if viewed from the results of the independent analysis of the sample t-test, it was found that a significant (2-tailed) value of 0.006 was smaller than 0.05, then H_0 was rejected which means that there was a significant difference in the elementary school students' narrative writing skills between the group of students who used a problem-based learning model with environmental literacy-oriented and the group of students who used conventional learning in the fifth-grade of MI Darul Qirom.

Based on the results of observations, the application of problem-based learning in the experimental class could improve the students' critical thinking skills, problem solving skills, and writing skills. It is because in its application, problem-based learning requires students to (1) be problem-oriented related to environmental problems, (2) direct students to study either individually or in groups, and (3) create works in the form of narrative writing related to the analysis of environmental problems, and (4) analyze and assess the problem solving process. The steps found in this study support the research conducted by Sari et al. (2021) that the steps for implementing the problem-based learning model include student orientation on problems, organization of students, guidance on student research whether individually or in groups, presentation of work, and analysis and evaluation of problem solving processes. In this study, the application of the problem-based learning model focuses more on environmental problems.

Based on the results of the independent sample t-test in this study, the results of the t-count are smaller than the t-table ($0.006 < 0.05$). It means that the application of the problem-based learning model has a significant effect on the students' writing skills. This is because in the implementation process, students are required to focus on problems, analyze, create narrative works/writings related to problems, and evaluate the results and process of solving these problems.

These results are in line with the research conducted by Yetti and Fitria (2021) that also applied the problem-based learning model in their research but with a different focus. The study that there were differences in average news writing skills before and after using the problem-based learning model. In addition, problem-based learning integrated with STEM could also improve environmental-literacy skills (Anita et al., 2020; Aviva et al., 2018). It was due to the effect caused by the use of the model. Several other research also explained that the application of the problem-based learning model improved student learning outcomes and writing exposition text skills in Indonesian language lessons (Kristyanawati et al., 2019; Kusrianti & Suharto, 2019; Wijaya & Fikri, 2019).

Through the problem-based learning model, students learn to analyze a problem, identify related facts, apply their knowledge, cooperate, and be actively involved in solving a problem (Nurtanto et al., 2020; Seibert, 2021; Yundayani et al., 2019). In this study, experimental class students were required to use all their abilities and went through various recursive processes through the application of problem-based learning models to create good narrative writing results. This is the underlying reason that the environmental literacy-oriented problem-based learning model is suitable to be used to improve students' narrative writing skills.

Not only using a fun learning model and requiring students to think critically, but this model also applied a literacy culture. One of them was the students' environmental literacy to read and understand every problem around them. Therefore, students tried to solve these problems and put them in well-written work, either fiction or non-fiction (narrative). It was in line with the research stating that the students' habituation in literacy, both in terms of reading literacy, mathematics, technology, and the environment, could affect other students' abilities such as writing and telling stories (Jatnika, 2019; Kacetyl & Klímová, 2019; Puspitaningrum & Nuryanto, 2019). The research results stated that the problem-based learning model with environmental literacy-oriented allowed students to develop and build knowledge through problem-solving. Hence, hopefully, the final objective of learning was to produce students who have the knowledge and skills to solve problems faced in society.

CONCLUSION

In this study, it was found that the application of a problem-based learning model oriented towards environmental literacy could enhance the students' narrative writing skills, especially those related to environmental problems. The problem-based learning model did not only hone the students' writing skills but also enhance their ability to solve problems,

think critically, and work together in groups to solve problems. It means that educators in elementary schools, especially in Indonesia, can apply the problem-based learning model as a way to overcome problems related to critical thinking skills, problem solving, writing, reading, and low learning outcomes.

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