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THE EFFECT OF *THE PROJECT-BASED LEARNING MODEL* ON THE CREATIVE THINKING ABILITY OF SCIENCE STUDENTS IN GRADE VIII SALAFIAH SYAFI'IYAH JUNIOR HIGH SCHOOL

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Abstract

This research employed an experimental method using the Project Based Learning (PJBL) instructional model to enhance students' creative thinking abilities in the subject of Natural Sciences (IPA) in the eighth grade of SMP Salafiah Syafi'iyah. The study involved two classes, one as the experimental group implementing PJBL learning model, and the other as the control group implementing conventional instructional model. Data were collected through pretests and post-tests measuring students' creative thinking abilities before and after the instruction. Data analysis involved descriptive and inferential statistics, including an independent t-test to compare the differences between the two groups. The descriptive analysis results indicated that the average post-test score in the experimental group (77.00) was slightly higher than that of the control group (72.00). However, this difference was not statistically significant. Furthermore, the normality analysis showed that both groups had a normal distribution of data. An independent t-test was conducted to examine the significant difference between the two groups. The test results revealed a significant difference between the experimental group and the control group in students' creative thinking abilities (p = 0.020). The mean difference between the two groups was 5.00, with a 95% confidence interval ranging from 0.81 to 9.19. Based on the findings of this study, it can be concluded that the implementation of the Project Based Learning (PJBL) instructional model has a positive influence on enhancing students' creative thinking abilities in the subject of Natural Sciences (IPA) in the eighth grade of SMP Salafiah Syafi'iyah.

Keywords: Creative Thinking, *Project Based Learning* (PJBL), Natural Sciences (IPA),

INTRODUCTION

Education is a method to impart knowledge, understanding, and skills to individuals. The purpose of education is to develop the potential of students to become active individuals in the learning process. The success of learning carried out by teachers depends on the attitude, behavior, and mindset of students (Fitri, 2016; Mawarni & Muhtadi, 2017). Therefore, learning objectives are very important in achieving the success of education in Indonesia, including education in the First School (SMP). The independent curriculum that is currently being implemented has characteristics that focus on the development of students' *soft skills* (Ministry of Education and Culture, 2023). However, there are concerns that the Natural Sciences (IPA) material in the book is not in-depth enough (Fatqurohman, 2010; Hurianti & Tastra, 2018). In this case, it can be seen that students' creative thinking skills are lacking, which has an impact on students' science learning outcomes.

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Natural Sciences (IPA) is one of the subjects that has importance in the context of education, because knowledge in science is very useful in daily life (Ariawan & Pratiwi, 2017; Mahendra, 2017). However, student achievement in science learning in Indonesia is still low. Data from the Programme for International Student Assessment (PISA) in the period 2000-2018 shows that Indonesia's mathematics ranking is ranked 70 out of 78 countries, indicating that Indonesia consistently ranks lowest in PISA results (Fuadi, Robbia, Jamaluddin, & Jufri, 2020; Sariani, 2020). Despite the stagnation of PISA scores over the past 10-15 years, there has been a slight increase in the difference between scores and the average OECD scores, as seen in the following graph.

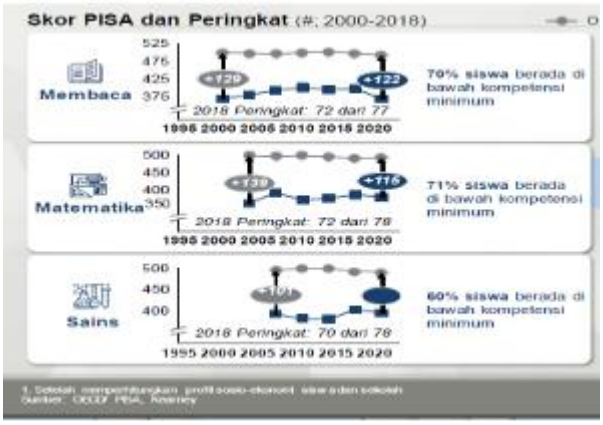

Figure 1. PISA Score

Education in the 21st century encourages students to be more active in the learning process, and teachers are required to use the learning model suggested by the Independent Curriculum so that students are actively involved. This demand requires students to have the 4C skills, namely Collaboration (working in a group), Creativity (thinking creatively and not fixated on one way), Communication (reciprocity between teachers and students), and Critical Thinking and Problem Solving (being able to think critically in dealing with situations and solving problems) (Andrian & Rusman, 2019; Yokhebed, 2019). Wrong

one important component of the 4Cs that students must possess is the ability to think critically. Activities that involve critical thinking skills include formulating problems, planning strategies or tactics, and formulating conclusions (Budiana, Sudana, & Suwatra, 2013; Purwanti, 2015). At the junior high school level, it is important to develop a critical mindset of students to prepare them for future developments.

One effort to improve students' critical thinking skills is to give them the opportunity to actively build their own knowledge, either individually or in groups, using a cooperative learning model. The cooperative learning model is a learning model that uses a grouping system to achieve predetermined learning goals (Dadri & Putra, 2017; Witari, Putri, & Rati, 2017). An important goal of cooperative learning is to teach students cooperative and collaborative skills (Dharsana & Sidabutar, 2018). In addition to the cooperative learning model, you can also use *the Project Based Learning* (PJBL) learning model.

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Project Based Learning (PJBL) is student-centered learning through meaningful learning experiences. Planned learning is a product that arises from projects carried out during learning (Barus et al., 2022). PJBL requires learning in group projects to solve specific problems in a way that supports the student's adjustment process. (Purnomo and Ilyas, 2019 in Barus et al., 2022). PJBL is also a model that focuses on creative thinking, problem-solving, and interaction between learners and peers to create and use new knowledge (Hidayat, 2021). Through project-based learning, learners will work within teams, discovering the skills of planning, organizing, negotiating, and making consensus on the issues of the tasks to be worked on, who is responsible for each task, and how information will be collected and presented scientifically. Project-based learning models constructed from constructivist learning principles are suspected to be able to foster values that are to be built in soft skills such as: problem solving, creativity, innovation, teamwork, communication and presentation skills (Hidayat, 2021).

The PBL model also focuses on the main principles and concepts of a discipline, involving learners in solving problems and other meaningful tasks, encouraging learners to work independently to construct their own learning. This means that through this model, students' creativity is required through their learning steps. Thus the writer feels in accordance with the existing problem. Therefore, the researcher tried to study it in a study entitled "The Influence of the Project Based Learning Model on the Creative Thinking Ability of Science Students in Grade VIII of Salafiah Syafi'iyah Junior High School".

RESEARCH METHODS

This study uses an experimental method in the form of providing a mathematical learning treatment with a Project Based Learning model and then analyzes how it affects students' creative thinking skills. In this study, the author will use two classes, namely one class as an experimental class that implements learning with the Project Based Learning model, and one class as a control class that applies the conventional model. The population in this study is all students in grade VIII of Salafiah Syafi'iyah Junior High School. The population amounted to 60 students spread across 2 classes. The sample in this study, namely one class, will be used as an experiment and another class as a control class as a comparison. The selected experimental class was class VIII-A with 30 students and the control class that was selected, class VIII-B with 30 students.

Data collection is carried out by providing pretest and *post test questions* to students. The instrument is in the form of a scientific reasoning test in the form of an essay totaling 5 questions. The test was carried out twice, namely before the implementation of learning (*pre-test*) and after learning (*post-test*). *The pre-test* is carried out to determine the critical thinking ability of students before learning, and *the post-test* is carried out to find out the critical thinking ability of students after learning.

The data analysis used in this study was descriptive statistical analysis and inferential statistics using SPSS 25. Descriptive analysis includes the analysis of mean, highest and lowest values and standard deviation. The inferential analysis used was an independent sample T test. Prerequisite tests before performing the T test are the *Shapiro-Wilk normality test* and the homogeneity test.

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RESULTS AND DISCUSSION

Project-based learning or PJBL is learning to use problems as a starting point to create projects. The purpose of this learning model is to increase critical thinking, creativity, and innovation (Hidayat, 2021). Sani (2017, in Hidayat 2021), shows that the steps of PJBL learners are divided into four parts as follows:

a. Students create groups of 3-4 students, to work on projects for 3-8 weeks.
b. The teacher asks the picker questions that are complex in nature to provoke the students' critical potential, then directs them to the project.
c. The project is carried out based on the schedule, starting from designing, projection, presentation, to the final result in the form of a project exhibition.
d. The teacher provides feedback and final assessment of the project product.

The results of the description analysis for *the post-test* can be presented in the following table.

Table 1. *Descriptive Analysis Results*

Descriptive Statistics					
	N	Min	Max	Mean	Hours of deviation
Control class	30	60	90	72,0000	8,05156
Experimental Classes	30	60	90	77,0000	8,15792
Valid N (listwise)	30				

The results of the table show that the lowest value in the control class and the experimental class is the same, which is 60 and the highest value also has the same value of 90. The average between the control class and the experimental class did not have a considerable difference. The control class had an average value of 72.00 with a standard deviation of 8.05156 and the experimental class of 77.00 with a standard deviation of 8.15792. The results showed that before being given the treatment, the control class and the experimental class had the same value and ability.

Table 2. *Normality Test Results*

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Itself.	Statistic	df	Itself.
Control class	,120	60	,031	,948	60	,0227
Experimental class	,339	60	,024	,637	60	,083
a. Lilliefors Significance Correction						

Normality testing with Kolmogorov-Smirnov and Shapiro-Wilk showed that the control class had a significance number of 0.041 and 0.227 respectively, while for the experimental class, the significance of the statistical values of Komogrov-Smirnov and

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Shapiro-Wilk was obtained respectively of 0.024 and 0.083. This means that the significance of the two statistical tests on each data group is greater than 0.05. So, it can be concluded that the data on student learning outcomes in each group have been distributed normally.

Table 3. *Group Statistics Test Results*

Group Statistics					
	class	N	Mean	Hours of deviation	Std. Error Mean
value	Control class	30	77.00	8.158	1.489
	Experimental Classes	30	72.00	8.052	1.470

Based on the "*Group Statistic*" table above, it is known that the number of data from the control class and the experimental class is the same, which is 30 students. Average learning outcomes for the control class

77.00, while for the experimental class it was 72.00. Thus, it can be concluded that there is a difference in student learning outcomes in the control class and the experimental VB class. However, to prove whether the difference is significant (real) or not, it is necessary to interpret the output of the following "Independent Sample Test".

Table 4. *Independent Samples Test Results*

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Itself.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
value	Equal variances assumed	,028	,867	2,389	58	,020	5,00000	2,09268	,81105	9,18895

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	Equal variances not assumed			2,389	57,990	,020	5,00000	2,09268	,81103	9,18897

Based on the above output, it can be seen that the value of Sig. Levene's Test Equality of Variances is 0.867 > 0.05, so it can be interpreted that the data variance between the control class and the experimental class is homogeneous or the same. The results of the "Independent Samples Test" output table in the "Equal varianes assumed" section are found to be Sig. (2-tailed) values of 0.020 < 0.05, this means that H_0 is rejected and H1 is accepted. Thus, it can be concluded that there is a significant (real) difference between student learning outcomes in VA classes (control groups) and student learning outcomes in VB classes (experimental groups). The results of the above output are known to have a "Mean Difference" value of 5,000. This value shows the difference between the reasoning ability of students in the control class and the reasoning ability of students in the experimental class and the difference is 0.811 to 9.189 (95% Confidence Interval of the Difference Lower Upper). It is known that the calculated t value is 2.839 > t table of 2.00172. It can therefore be concluded that H0 is rejected and H1 is accepted. With this approach, it can be concluded that there is a significant difference in science learning outcomes between groups of students who are taught using the PJBL model using the conventional learning model in students Class VIII of Salafiah Syafi'iyah Junior High School

CONCLUSION

The *Project Based Learning* method can help students improve their *creative thinking* skills because in this method, students are invited to continue thinking. This can be shown from the average *post-test* result score of 77.00 which is higher than using the conventional learning model. Testing the hypothesis t calculated as 2.839 > t table of 2.00172. It can therefore be concluded that H0 is rejected and H1 is accepted, this is a significant difference *in* post-test results

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