



The Project-Based Learning Model On The Creative Thinking Abilities Of Early Class Students In Science Learning At Sdn 12 Kota Barat Gorontalo City

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Abstract

students in the early science learning classes at SDN 12 Kota Barat, Gorontalo City. The method used in this research is quantitative with a Quasi-Experimental design. Data collection techniques use questionnaires, tests, and observations. Data analysis uses descriptive statistics by describing the data that has been collected in the form of students' creative thinking abilities based on description tests which represent indicators of students' creative thinking abilities. The population in this study was an initial class of 30 students, where the control class received conventional model treatment and the experimental class received PBL model treatment. The average pretest score for the control class was 42.6 and the average pretest score for the experimental class was 44.2, which was included in the sufficient category. From these results, the average post-test score for the experimental class is higher than the average post-test score for the control class, so there is an influence of the PBL model on students' creative thinking abilities in early grade science learning at SDN 12 Kota Barat, Gorontalo City. These results are supported by the results of the research hypothesis test which shows the value of count = 2.929 > table 2.048 at a significance level $\alpha = 0.05$. So from the results of the hypothesis test, the test results show that H_0 is rejected and H_1 is accepted.

Keywords: Think creatively; Early Grade Science; PBL model.

1. INTRODUCTION

Creative thinking is the ability to generate new, different ideas or insights. Creative thinking is defined as the application of imagination in dealing with certain problems, and systematic thinking in generating ideas and solving problems. The main goal of creative thinking skills is to educate students not only to be able to solve problems but also to be able to apply the principles of scientific thinking [1]. Creative thinking skills are needed in all subjects, especially science subjects. In science learning, early-grade students are directed to be able to think scientifically. With this scientific thinking ability, students will understand science concepts easily. Science lessons have many natural concepts and phenomena and to achieve learning goals teachers usually give problems to students to then solve with critical and creative thinking.

The Project Based Learning model is student-centered in the form of observation, data-based decision-making, collaboration, and product-oriented, and involves document preparation [2]. This project-based learning focuses on helping students understand concepts by making in-depth observations about a problem and finding solutions by creating products. Project Learning focuses on characteristics and principles aimed at early-grade students who actively participate in learning, manage assignments and study time, solve problems, and integrate learning smoothly to produce a product or work based on student creativity. By using the Project Based Learning model in learning, it is hoped that it can improve students' creative thinking abilities. especially in science learning, where it is hoped that with the Project Based Learning learning model students will be able to understand science concepts and their influence in everyday life.

A good learning process is learning that can create good learning outcomes for students. Teachers have a role in determining the right strategy, one of which is choosing a learning model that suits the learning objectives. A learning model is a learning context and operational design that has a name, characteristics, logistical sequence, and facilities related to learning needs. The learning model is a framework for implementing learning approaches, procedures, strategies, methods, and techniques from planning to the end [3].

The Project Based Learning model is student-centered in the form of observation, data-based decision-making, collaboration, and product-oriented, and involves document preparation [2]. Project-based learning or Project Based Learning began in 1916 by the American philosopher John Dewey. The project-based learning model better known as project-based learning is a learning model that brings students' learning approaches closer. Grand [4]. explains that the project-based learning model is a structured learning model that involves students in learning complex knowledge and skills with authentic questions and planning products and assignments. The project-based learning model emphasizes students' active participation in the learning process, and under these conditions, the project-based learning model can increase student independence and accommodate various student skills so that learning can be carried out more optimally [4].

Based on some of the definitions above, it can be concluded that the project-based learning model is a student-centered learning model where in learning the teacher allows students to play an active role in planning their learning activities, carrying out projects and solving existing problems based on the projects they are working on.

Learning using the project-based learning model has principles. The principles of the Project Based Learning learning model are explained in the book [5]. Centralistic principle

- 1) Principle of guiding questions
- 2) Principles of constructive investigation
- 3) Principle of autonomy
- 4) Realistic principle

Implementing the learning process using the Project Based Learning model is carried out in steps. The Project Based Learning learning steps developed by Lucas are as follows [6]; 1) Determination of basic questions; 2) Develop a planning process.; 3) Prepare an activity schedule.

Teachers and students together create a schedule of activities to complete the project. Activities in this stage are creating a timeline for completing the project,

setting deadlines, encouraging students to plan new methods, guiding students, and asking students to describe their method choices in the project.: 1) Monitoring student and project progress.; 2) Assessment of work results; 3) Evaluation.

Project-based learning for students in elementary schools needs to be guided by teachers. The stages of project-based learning that can be applied to elementary schools include a) getting ideas, b) designing projects, c) preparing projects, d) creating projects, e) exhibiting/presenting projects.

The ability to think creatively is an important ability for students to have. This creative thinking ability can influence student learning success. Creative thinking consists of two words, namely thinking and creative. Thinking is an ability that humans have and is an important basis for carrying out all life activities, even in the smallest problems. The definition of thinking in the KBBI is using reason or thoughts to decide something, considering it in memory. Meanwhile, creativity is creative power, having the ability to create or create or be creative [7].

Creative thinking is a learning process in which teachers must be able to motivate and bring out students' creativity during learning by using various methods, strategies, and models, for example working in groups, solving problems, and creating work [8]. Weisberg stated that creative thinking is a way of thinking that encourages the emergence of something new.

From the definitions above, it can be concluded that the ability to think creatively is the ability to create something new with ideas and ideas that are broader and create creativity that is different from what has ever existed, and the ability to think creatively is the ability to use reason to decide something new.

The ability to think creatively has several indicators. the indicators of creative thinking , think smoothly, think flexibly, elaboration, originality. Learning is a process of transferring knowledge which is carried out by imparting knowledge to students. Science learning is a subject taught from elementary school to middle school level. Science is needed in everyday life to meet human needs by solving problems in both the physical and social environment [9].

Science is a field of knowledge that starts from natural phenomena. Science is defined as the result of thinking and investigation about natural objects and phenomena obtained by scientists with experimental skills using scientific methods. This definition provides an understanding that science is a field of knowledge that is built on observations including mathematical reasoning and data analysis of natural phenomena. So in essence, science is the science of natural phenomena which is expressed in facts, concepts, principles, and laws whose truth has been proven through a series of scientific method activities [10]

Science learning is mandatory learning in elementary schools as an effort to introduce phenomena that exist around us. The aim of science learning in elementary schools is to:

- 1) Remind curiosity and a positive attitude towards science, technology, and society.
- 2) Understand the skills to explore the natural environment, solve problems, and make decisions.
- 3) Uncover insight and understanding of scientific and scientific concepts that will be useful and can be applied in everyday life [11].

As a field of science, science learning has characteristics that differentiate it from other fields of science. The characteristics of IPA are explained as follows [10]: a) It has scientific value, meaning that everyone can use scientific procedural methods to prove the truth of the science as was done by previous inventors.; b) A

systematically organized collection of knowledge, usually used for natural phenomena.; c) Theoretical knowledge is obtained or placed in a special way, namely by observing, experimenting, reasoning, and compiling theories that are interrelated between one method and another.; d) A set of interrelated concepts with a concept chart developed as a result of further experimentation and observation.; d) Consists of four components, namely process, product, attitude, and application.

Science learning in elementary schools teaches us to introduce natural events around us. In the science learning process in particular, things that can be applied to lower class students are, namely, the learning process using examples of real objects, which can be seen directly, and which are often encountered in everyday life. With concrete objects, students can easily understand the material taught by the teacher.

2. METHODS

This research was carried out at State Elementary School 12 Kota Barat. In this research, the students in the early grades were learning science material, objects, and their forms at SDN 12 Kota Barat. The type of research used in this research is quantitative with a quasi-experimental or quasi-experimental design. This Quasi-Experimental Research was carried out to test hypotheses about the influence of action or not.

The project-based learning model is a student-centered learning model in which students in learning allow students to actively participate in planning their learning activities, carrying out projects and solving existing problems based on the projects they are working on.

Data collection techniques are a very strategic step in research because the main aim of research is to obtain data. Data collection can be done in various ways, sources, and settings [12]. The data collection techniques used in this research are tests, observations, and questionnaires.

Descriptive statistical analysis is statistics used to analyze data by describing the data that has been collected as it is without intending to make conclusions that apply to the general public [12]. To measure students' creative thinking abilities based on a description test which represents indicators of students' creative thinking abilities. After calculating the results of the student's creative thinking ability test, testing was then carried out to see the difference between the post-test and pre-test results. This test is carried out with the N-gain test. The N-gain test is a test of the difference between post-test and pre-test scores. Gain shows an increase in understanding or mastery of concepts after the teacher has carried out the lesson.

3. RESULTS AND DISCUSSION

Researchers researched science learning objects and their forms. In the research, the researchers held 2 meetings, 1 time in the control class with a conventional learning model and 1 time in the experimental class with a project-based learning model. In implementing the project learning model for researchers, it is not enough to just have one meeting because in this model students have to prepare tools and materials and need time to design the project.

Research in the control class uses conventional models. Then research on experimental classes with a project-based learning model. The second class studied material objects and their forms. Before the learning activity began the researcher gave a pre-test as an initial test and after the learning activity was completed the researcher gave a post-test. The data collected in this research is data about students' creative thinking abilities.

An initial test or pretest is given to students before receiving treatment. Pretest measurements were carried out at Control Class consists of 15 students in the initial class and 15 students in the initial class of the Experiment Class. The pretest given was 10 questions aimed at finding out students' initial creative thinking abilities. In summary, the pretest results for both classes are as follows.

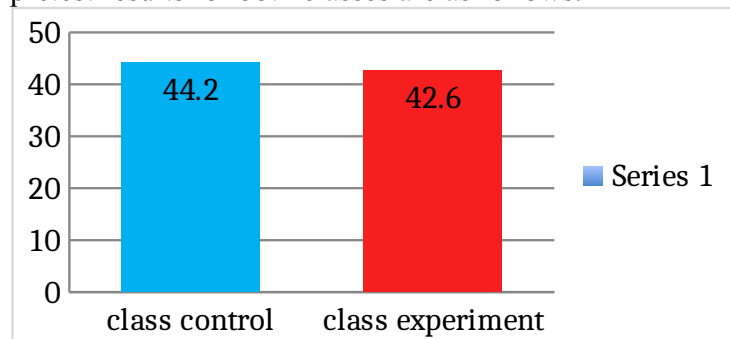


Figure.1 Histogram avarange *pretest post-test* class control & experiment and experiment

Table 1. Sampel experimental claas dan the control class

NO	Indicator	Average value			
		Control Class	Criteria	Experimental Class	Criteria
1	Think smoothly	43.1	Enough	46.6	Enough
2	Think flexibly	44	Enough	40.4	Not enough
3	Originality	42.6	Enough	48	Enough
4	Elaboration	40	Not enough	42.6	Enough
Average		42.6%	Enough	44.2%	Enough

From Table 1 above, it can be seen that with the same sample size between the experimental class and the control class, namely 15 students, it shows that the average score for the *experimental class is higher*.

Table 2. Result posttest claas control and experiment

NO	Statistics	Class control	Experimental class
1	Number of students (N)	15	15
2	Ideal value	100	100

3	Maximum score	64	60
4	Minimum score	20	28
5	Reach	44	32
6	Average	42.6	44.2
7	median	48	48
8	Mode	20	28
9	Standard deviation	16.32	14.45

From the control class in the pretest results of students' creative thinking abilities. Even though the pretest results obtained in the experimental class were higher, the results obtained were not much different, namely they were in the sufficient category. This can be seen from the pretest results, the average value obtained in the experimental class was 44.2 and the average value obtained in the control class was 42.6. Next, the pretest data from the experimental group and control group were calculated based on the indicators for each creative thinking ability test question that had been given. The following are the results of pretest data from indicators of students' creative thinking abilities.

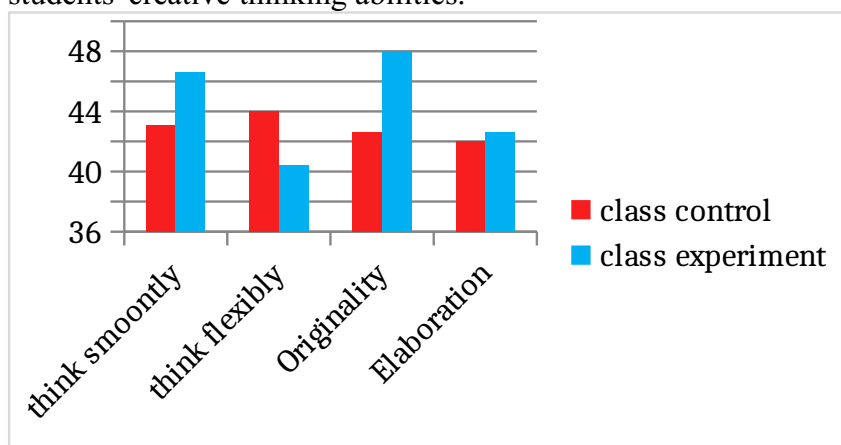


Figure 2. Histogram rata-rata *pretest* per indicator

Before giving the posttest, researchers carried out learning activities in the control class and experimental class with different treatments, namely, in the control class the treatment was given using conventional methods, namely lectures, questions and answers, and discussions, while in the experimental class, the treatment was given using the Project Based Learning model. After the two groups were given different treatments, the researcher then distributed the final test or posttest. In summary, the posttest results for both classes are as follows.

Table.3 Hasil *posttest* class control and experiment

NO	Statistics	Class control	Experimental class
1	Number of students (N)	15	15
2	Ideal value	100	100
3	Maximum score	92	100

4	Minimum score	40	72
5	Reach	52	28
6	Average	72.2	87.7
7	median	76	92
8	Mode	60	100
9	Standard deviation	16.93	11.46

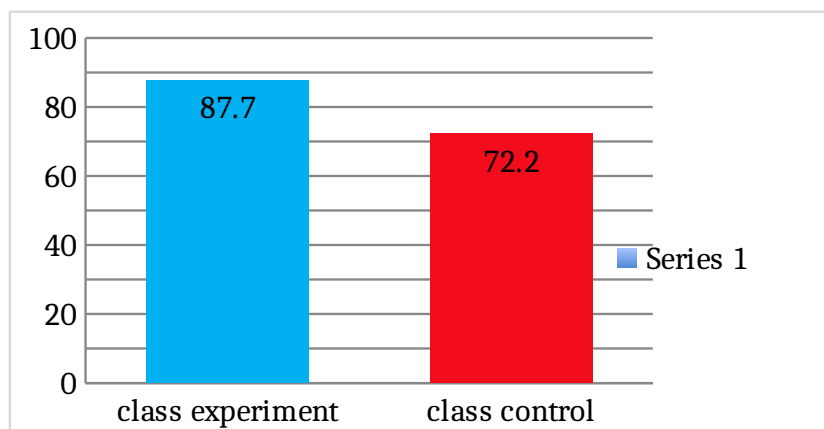


Figure.3 Histogram avrange *post-test* class control and experiment

Table.4 Average post-test indicators for control and experimental classes

NO	Indicator	Average value			
		Control Class	Criteria	Experimental Class	Criteria
1	Think smoothly	77.3	Good	89.3	Very good
2	Think flexibly	69.7	Good	87.5	Very good
3	Originality	70.6	Good	86.6	Very good
4	Elaboration	72.4	Good	87.5	Very good
Average		72.2	Good	87.3	Very good

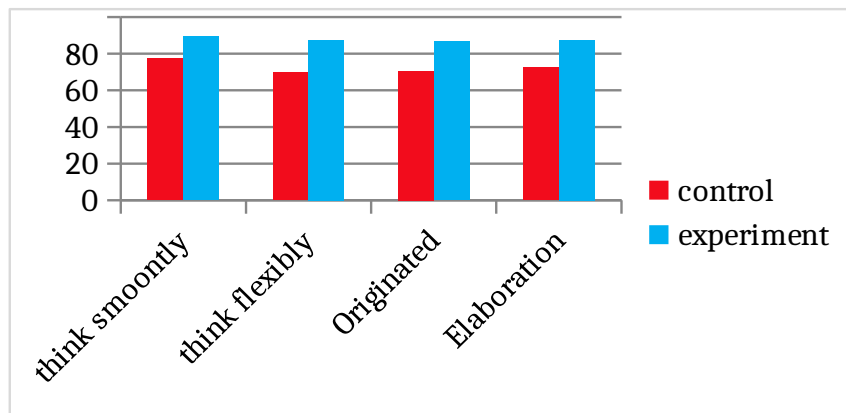


Figure 4. Histogram Avarange *post-test* per indicator

The results of the pretest carried out in the control and experimental classes showed results that were not much different, where the average pretest score for the control class was 42.6 and the average pretest score for the experimental class was 44.2. Both results are in the sufficient category.

The results of the posttest for both classes showed an improvement. The average score obtained in the experimental class was 87.7 in the very good category and the average score obtained in the control class was 72.2 in the good category. From these results, it can be seen that the average post-test score for the experimental class is higher than the average post-test score for the control class.

Based on the results of hypothesis testing with a significance level of 5% (0.05), the calculated t value = 2.929 and the t_{table} value is 2.048 or in statistical symbols the $t_{calculated} = 2.929 > t_{table} = 2.048$, then based on the test H_0 is rejected, H_1 is accepted. So it can be concluded that there is an influence of the project-based learning model on students' creative thinking abilities in science learning in the early grades of SDN 12 Kota Barat, Gorontalo City

4. CONCLUSION

The research demonstrates that the Project-Based Learning (PBL) model significantly enhances students' creative thinking abilities in science learning. Although the experimental and control classes initially had comparable pretest results, with average scores of 44.2 and 42.6 respectively, both classified as "sufficient," the posttest results showed a marked improvement in the experimental class. The experimental class, taught using the PBL model, achieved an average posttest score of 87.7, categorized as "very good," compared to the control class's average of 72.2, categorized as "good." Statistical analysis confirmed the impact of the PBL model, with the t-test results showing $t_{calculated} = 2.929$ greater than $t_{table} = 2.048$, leading to the rejection of H_0 . This indicates a significant influence of the PBL model on students' creative thinking skills. Therefore, the study concludes that the PBL model is an effective approach to fostering creative thinking abilities in science education at the primary school level.

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