

# THE EFFECT OF CONCEPT ACHIEVEMENT ON CRITICAL THINKING AND CREATIVE THINKING SKILLS IN ELEMENTARY SCHOOL STUDENTS

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**Abstract:** This research aims to describe the effect of applying the concept achievement learning model on the ability to think critically and creatively in elementary school student. Students' capacity for original thought allows them to come up with solutions to mathematical issues in a variety of ways. This research was conducted in 6th grade at UPI Cibiru Laboratory Elementary School in the 2021–2022 academic year on cubes and blocks lessons. This research used a quasi-experimental approach with a single experimental group. There were 22 students who made up the experimental group. The selection of purposive sampling led to the creation of the class group. The independent variable in this study is the achievement of the concept, while the dependent variable is the ability to think critically and creatively. The research design used is the Nonequivalent Posttest-Only Control Group Design. The instruments used in this research are test and non-test. The test is in the form of questions to determine the effect of students' critical and creative mathematical thinking skills between those using the Concept Achievement learning model and the Inquiry Learning Model. The non-test is in the form of a Likert scale to measure students' self-confidence. The data analysis technique used prerequisite tests, namely the normality test, homogeneity test, and the average difference test. Furthermore, the correlation test uses the Pearson or Spearman test and the coefficient of determination. The results showed that (1) the concept achievement model can improve critical thinking skills and (2) the concept achievement can improve creative thinking skills.

**Keywords:** Concept Achievement Learning; Mathematical Critical Thinking Ability; Mathematical Creative Thinking Ability.

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## INTRODUCTION

Mathematics is a science that is applied in many ways. Human beings involve mathematics in every activity in life. Apart from being a science used in solving problems faced daily, mathematics is a supporting science for other sciences. Permendikbud (2016: 21) in the curriculum content standards explains that "Mathematics is a universal science that underlies the development of modern technology and has an important role in developing the ability to think, communicate and creativity.

The concept achievement learning model was built in relation to student thinking studies conducted by Bruner, Goodnow, and Austin (1967). The learning model of achieving this concept is relatively closely related to the inductive learning model. Both concept achievement learning models and inductive learning models are designed to analyze concepts, develop concepts, teach concepts and to help students be more effective in learning concepts. The concept achievement learning model is an efficient method of presenting organized information from a broad topic into a more understandable topic for each stage of concept development. This concept achievement learning model can provide a way of conveying concepts and clarifying concepts and train students to be more effective in concept development.

Joyce, B. (2010:143) states that, "Learning the achievement of concepts sharpens the basic thinking skills." From Joyce's statement, it shows that the concept achievement learning model is contained in

the teaching of students' thinking, because in the concept achievement learning model there are several stages that must be passed, such as categorizing, forming concepts by paying attention to various kinds of attributes (such as essential attributes, attribute values, critical attributes, and attribute variables)

According to Hamzah (2010:12) says "the learning process is well creative, if learning is student-centered where students find for themselves a rule that is (concept, theory, understanding) through an example that describes the rules as the source". In other words. Students are guided by the teacher in understanding a truth in finding concepts so that they are drawn inductively. The learning model of concept achievement has the characteristic of presenting negative examples (false) and positive examples (true) of the application of the concepts taught, then observing examples found the meaning of the concept. What should be paid attention to in the use of this model is the selection of the right example for the concept to be taught, that is, an example familiar to the student's life.

According to Maulana (2017:5), thinking includes two aspects, namely critical and creative. These two aspects can motivate humans to look at the problems that exist in their lives critically, then try to find a way out to solve them creatively. When a person thinks, then in his thinking there are several analysis questions such as 5W + 1H, namely what (what), who (who), when (when), where (where), why (why), and how (how). Based on this question, a person analyzes the problem that occurs in

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his life until he will gradually find a way out

to solve the problem critically.

**MATERIALS AND METHODS**

The research method used is an experiment method with a quasi-experimental research design. Quasi-experimental research involves two groups of samples. One group as a control group and one experiment group.

According to Sugiono (2011: 73) the quasi-experimental research method consists of 2 types of designs. The research design used was The Nonequivalent Control Posttest-Only Group Design. Before the pretest was carried out, the sampling technique was not randomly selected in both the experiment group and the control group, but the class used as the study was the one that had the same or homogeneous character. Table 3.1 presents the research design of The Nonequivalent Control Posttest-Only Group Design.

X<sub>2</sub>= Treatment of learning using Inquiry learning

O<sub>1</sub> = Test students' understanding of the material to be studied

O<sub>2</sub> = Testing students' understanding of the material they have learned

**RESULTS AND DISCUSSION**

According to the research objectives that have been presented in chapter I, to find out the results of the study, data is needed in the form of scores that describe students' critical thinking and creative thinking abilities from the research sample, namely pretest scores for students' critical thinking and critical thinking skills at the beginning of the meeting, postes scores to find out students' critical thinking skills at the end of the meeting, as well as improvement scores (gain), That is the difference between postes and pretest scores.

After all the data is obtained, data processing is carried out as research evidence. The following will be presented the final results of the study. After obtaining the normalized gain value, the amount of data of the experimental class and control class is obtained, the average, the standard deviation and the maximum and minimum values of each class. The results of the calculations are presented in table 2.

**Table 1. Research Design The Nonequivalent Posttest-Only Control**

| Class  | Pretest | Treatment      | Posttest |
|--------|---------|----------------|----------|
| WED    | O-O     | X <sub>1</sub> | O-O-     |
| MONTHS | O-O     | X <sub>2</sub> | O-O-     |

**Group Design**

Information:

TO = Experiment Class

KK = Control Class

X<sub>1</sub>= Treatment of learning using Concept mastery learning

**Table 2. Posttest Score Hypothesis Testing**

| Result | Class | Sum of Ranks | Itself. | Information |
|--------|-------|--------------|---------|-------------|
|--------|-------|--------------|---------|-------------|

|      |            |        |       |             |
|------|------------|--------|-------|-------------|
| Post | Control    | 231,00 | 0,000 | Significant |
|      | Experiment | 253,00 | 0,000 |             |

Based on the Rank table of SPSS data analysis calculations, it can be seen that in the Negative Ranks control group or the difference (negative) between mathematics learning outcomes for the Pre Test and Post Test is 0, be it on the N, Mean Rank, or Sum Rank values. This value of 0 indicates no decrease (subtraction) from the Pre Test value to the Post Test value. Positive Ranks or difference (positive) between mathematics learning outcomes for Pre Test and Post Test. Here there are 21 positive data (N) which means that the 21 students experienced an increase in mathematics learning outcomes from Pre Test scores to Post Test scores. The mean rank or average increase is 11, while the number of positive rankings or Sum of Ranks is 231.00. Ties is the similarity of the PreTest and Post Test values, here the Ties value is 0, so it can be said that there is no equal value between the Pre Test and the Post Test.

Meanwhile, in the *negative ranks* experimental group or the difference (negative) between mathematics learning outcomes for the PreTest and Post Test is 0, be it at N, Mean Rank, or Sum Rank. This value of 0 indicates no decrease (subtraction) from the PreTest value to the Post Test value. Positive Ranks or difference (positive) between mathematics learning outcomes for Pre Test and Post Test. Here there are 22 positive data (N) which means that the 22 students experienced an

increase in mathematics learning outcomes from Pre Test scores to Post Test scores. The mean Rank or average increase is 11.5 and while the number of positive rankings or Sum of Ranks is 253.00. Ties is the similarity of the Pre Test and Post Test values, here the Ties value is 0, so it can be said that there is no equal value between the Pre Test and the Post Test. Based on the analysis test above, it is known that the signification value (2-tailed) is worth 0.000. So it can be concluded that there are differences in pretest and posttest values in the experimental and control groups on critical thinking and creative thinking data.

Description of the results of improving students' critical thinking skills in the results of normalized gain calculations in experimental classes, namely learning using a concept achievement learning model, showed that 17 students were included in the normalized gain of high classification, 5 students included in the *normalized gain* of medium classification.

The results of the normalized gain calculation in the experimental class, namely learning using the inquiry model, showed 14 students including the normalized gain of high classification, 6 students included in the normalized gain of medium classification and 1 student included in the *normalized gain* of low classification. Here's the bar chart data in figure 1.

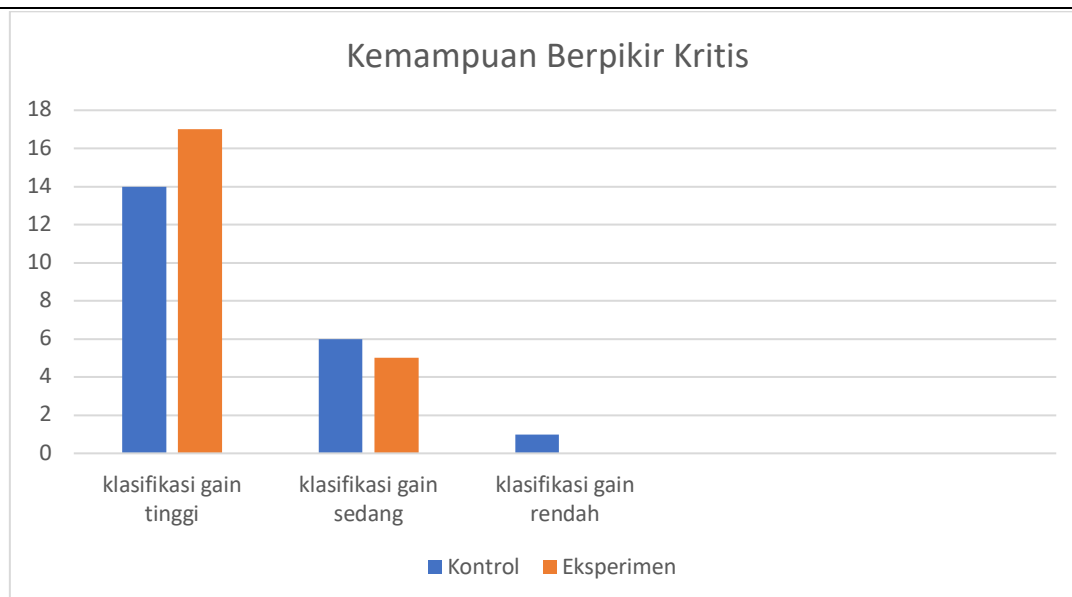


Figure 1. Comparison of the Number of Students In Each Of The *Normalized Gain* Classes Of Critical Thinking Ability

Description of the results of improving students' creative thinking ability in the results of normalized gain calculations in experimental classes, namely learning using a concept achievement learning model, showed that 16 students were included in the normalized gain of high classification, 6 students included in the *normalized gain* of medium classification.

The results of the normalized gain calculation in the inquiry class, namely learning using the inquiry model, showed 13 students including the normalized gain of the high classification, 6 students included in the normalized gain of the medium classification and 2 students included in the *normalized gain* of the low classification. Here's the bar chart data in figure 2.

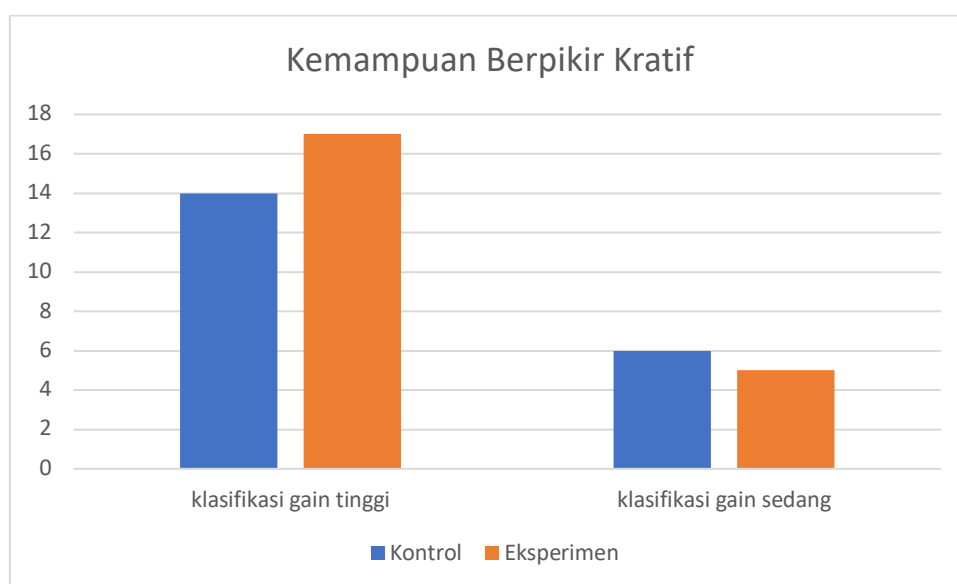


Figure 2. Comparison of the Number of Students in Each Of The *Normalized Gain* Classes

### Of Creative Thinking Ability

The number of students in each of the *Normalized Gain* Classes between the control class and the experimental class is different due to different learning processes. In the learning stage in the experimental class, it provides opportunities for students to solve problems in various ways so as to produce an idea or ideas of their own so that they can train their creative thinking skills. Meanwhile, the control class does not use creative ability indicators so that students are not trained in creative thinking skills.

### CONCLUSIONS

Based on the data analysis in Chapter IV, namely the Effect of Concept Achievement Learning on Critical Thinking and Creative Thinking Ability in Elementary School Students, it can be concluded as follows:

1. Based on the results of data analysis, there is a significant difference in critical thinking ability between those who obtain concept achievement learning and students who obtain class VI inquiry learning in laboratory elementary schools UPI Cibiru.
2. Based on the results of data analysis, there is a significant difference in creative thinking ability between those who obtain concept achievement learning and students who obtain class VI inquiry learning in elementary school laboratory UPI Cibiru.

Based on the results of data analysis, there is a significant influence on critical thinking and creative thinking skills between those who obtain concept

achievement learning and students who obtain inquiry learning. class VI of SD laboratory UPI Cibiru.

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