

THE EFFECTS OF LEARNING EXPERIENCE ON MATHEMATIC SELF-CONCEPT OF FIFTH GRADE ELEMENTARY SCHOOL STUDENTS IN YOGYAKARTA CITY AND BANTUL REGENCY

Kiki Vista Devi, Danuri

PGSD Universitas PGRI Yogyakarta, Yogyakarta, Indonesia

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Abstract

This research aims to 1) find out the mathematics learning experience, 2) find out the mathematic self-concept, and 3) investigate the effect of mathematics learning experience towards mathematic self-concept at fifth grade elementary school students in Yogyakarta City and Bantul Regency. This research was conducted in the academic year of 2020/2021. This study used a quantitative survey research technique with a sample of 794 fifth grade elementary school students in the regions. The analysis technique used was descriptive analysis technique, prerequisite test, and simple linear regression analysis with a significance level (α) = 0.05. Based on the findings, it can be concluded that in both regions, 1). there is a high category in mathematics learning experiences among the students with a percentage of 52,77%, 2) a moderate category of mathematic self-concept of the students is in a percentage of 42,95% and 3) there is an effect of mathematics learning experiences on mathematic self-concept which is shown by the positive and linear independent variable, $Y = 18.459 + 0.555$ with a significance 0,000, if the value of the student's mathematics learning experience is high, the mathematic self-concept will follow the high of experience and vice versa.

Keywords: Elementary Mathematics, Learning Experience, Self-Concept

INTRODUCTION

According to Muhibbin Syah (2012) learning is a process and a crucial element in education. Teaching and learning activities have a main goal that is the achievement of an expected competence which is started by designing a plan and learning instrument including learning objectives, materials, methods, media, evaluations, sources, and its environment that occurs due to interactions between the teacher and the students. Teaching and learning activities include an evaluation used to measure and assess the level of student achievement. In this case, it is said that the educational goals success depend on how the learning process is carried out by the students. The learning process will provide an overview both knowledge and behavior which emerges a benchmark for students success as learning

achievement (Oktaviani, R., & Atmojo, S. E. 2021). Learning achievement is used as the end point in determining educational success.

Achievements attained in teaching and learning process can be measured based on the students' cognitive, affective, and psychomotor outcomes. Indonesia as a developing country is still lagging behind other countries in the field of education. There are many students that obtain scores below the minimum score criterion, especially in mathematics. Mathematics is a subject provided to develop students' systematic, logical, and creative thinking skills. In Indonesia, mathematics is a subject that must be studied by students of elementary school to higher education. However, mathematics is found as a challenging subject since it belongs to abstract and theoretical science. Besides, it

is also found as a quiet boring subject full of formulas. This view has unfavorable effects for students as the lack of enthusiasm in the learning activities which leads to the students' ignorance toward the lesson, less involvement during the learning process, and the habit of cheating. Consequently, unsatisfactory learning outcomes cannot be avoided. Based on the results of TIMSS (Trend In International Mathematics and Science Study) research in 2015, Indonesian students' abilities achievement in mathematics subjects showed that Indonesia was ranked 44th of 49 countries with an average score of 397, while the average international score is 500. In another study, namely PISA (Program for International Student Assessment) which is organized by The Organization for Economic Co-operation and Development (OECD) and presented in Paris, it shows that Indonesia is ranked 70th out of 77 countries with an average score of 379. This score is far from the international average score, 489. This fact shows that Indonesia is classified as a country that is lagging behind in mathematics. This is caused by the lack of learning process implementation which leads to the students' low achievement. Passolunghi (2015) states that there are still many students at the elementary school who still experience excessive difficulties in the mathematics learning process. This condition causes the lack of self-confidence and increases anxiety. Besides, it reduces students' motivation to learn mathematics. The experience of this learning process can certainly affect self-concept of the students. Whereas in previous research it was found that mathematical self-concept can be a positive predictor in numeracy fluency (Kaskens et al., 2020).

A research related to learning experience in mathematics subject conducted by Gill & Dykeman (2019) toward 157 students shows that 7% students have positive experiences and the rest, 93% students, have negative

experiences. These results are caused by several factors within students such as difficulties in understanding the material, the quality of learning method, and the teacher's treatment to the students. Subject of this research are fifth grade students in Yogyakarta City and Bantul Regency. The subject was chosen based on several considerations. The first consideration is based on Piaget's theory that fifth grade elementary school students are in the final stages of pre-adolescence which are characterized by their ability in reasoning. The second consideration is that fifth grade students in Indonesia are directed to focus on facing the national exam at sixth grade. The researcher assumed that problem related to Mathematics as one of national exam subjects emerges at fifth grade.

Based on interviews towards fifth grade students of Wijirejo Elementary School, Bantul Regency on March 27th 2021 and Ngupasan Elementary School, Yogyakarta City on September 27th 2021, the researchers concludes that the students still face difficulty in joining mathematics learning process as the lack of understanding of important concepts and formulas being taught. This condition leads to the lack of understanding of the students' self-concept as feeling less confident when do their own math assignments and not being able to manage their time when they are asked for submitting assignments. Thus, the problems experienced by students in learning mathematics can affect them in forming self-concepts expected to carry out more optimal activities as knowledge gained by students can be found, formed, and developed by students themselves, the material mastery can be done independently, actively, and creatively by the students, the ability in mathematics subjects increases, and learning mathematics can be conducted by engaging social interaction, namely the interaction between students and their environment. Based on the description

above, this research was conducted to determine the effect of mathematics learning experience on the mathematics self-concept of fifth grade elementary school students in Yogyakarta City and Bantul Regency. This research is also expected to be a reference for teachers or pre-service teachers to understand the students' needs.

METHOD

This study uses a quantitative survey approach. The survey type used is Cross Sectional Survey Design. This research was conducted on April-June 2021. The location of this research was 27 public and private elementary schools in Yogyakarta City and Bantul Regency. The population used in this study was all students in Yogyakarta City amounting to 40,567 and Bantul Regency with a total of 73,549 students. The sample of this study was determined by the slovin formula so that the research sample obtained was 396 students in Yogyakarta City and 398 students in Bantul Regency. The sampling technique used is purposive sampling. The data collection technique in this study used a questionnaire (questionnaire) via Google Form which was then assessed by using a Likert Scale with a score of 1-5. The data analysis used in this research is descriptive analysis, prerequisites (normality and linearity), and simple linear regression analysis technique.

RESULTS AND DISCUSSION

1. Mathematic Learning Experience

The obtained data was calculated by using SPSS for Windows 16.0. The instrument used for measuring mathematics learning experience variables was a questionnaire consisting of 25 items. The score for each item is 1-5 thus when the items were calculated, the results of the mathematics learning experience variable were in the range of 25 – 125. Based on the data related to Mathematics learning experience, it is obtained that 29% students are in the very high category, 52.77% are in the high category, 17.38% are in the medium category, 0.76% are in the low category, and 0.25% are in the very low category. Based on SPSS test results, it can be seen that the Mean = 93.08 is in the interval class of $99 < X \leq 83$. Therefore, it can be concluded that the mathematics learning experience of fifth grade elementary school students in Yogyakarta City and Bantul Regency is included in the high category that is 52.77%. The frequency distribution of the variable data categories of the mathematics learning experience is presented in the following diagram.

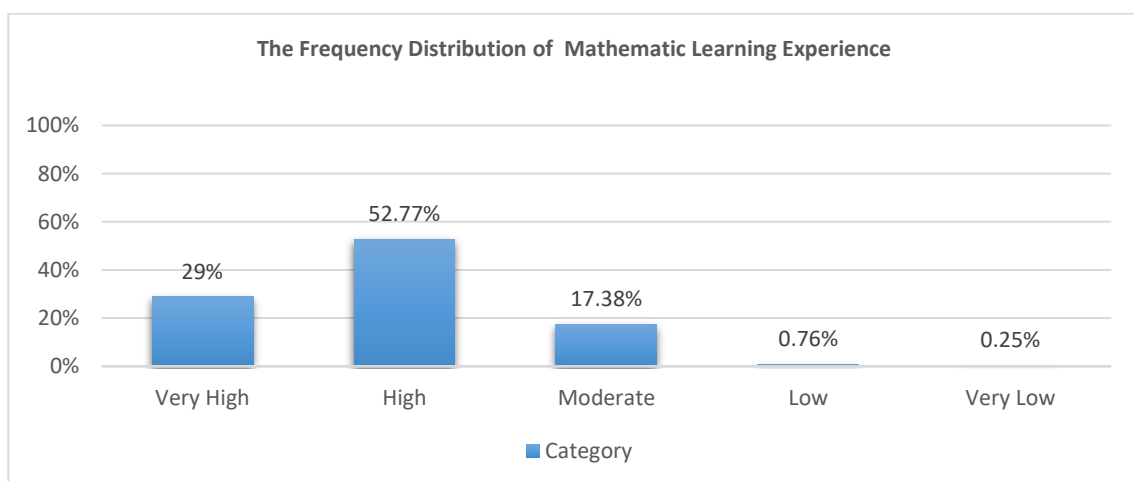


Figure 1. Frequency Distribution of Mathematic Learning

Based on the diagram above, it can be concluded that the mathematics learning experience for fifth grade elementary school students in Yogyakarta City and Bantul Regency are in the high category with a percentage of 52.77%.

2. Mathematical Self-Concept

Based on the data obtained and calculated by using SPSS For Windows 16.0, it is found Mathematic self-concept measurement instrument in the form of a questionnaire consisting of 21 items with score range 1-5 each. Therefore, the results of mathematical self-concept variable are in the range of 21 – 105. Based on the questionnaire result, the mathematical

self-concept variable category includes 12% in the very high category, 36.78% in the high category, 42.95% in the moderate category, 7.93% in the low category and 0.63% in the very low category. It can be seen from the results of SPSS test that the Mean = 70, 13, 08 is in the interval class $69 < X < 56$. Thus, it can be concluded that the mathematics self-concept of fifth grade elementary school students in Yogyakarta City and Bantul Regency is included in the medium category, 42.95 %. The frequency distribution of the mathematical self-concept variables data categories is presented in the following diagram.

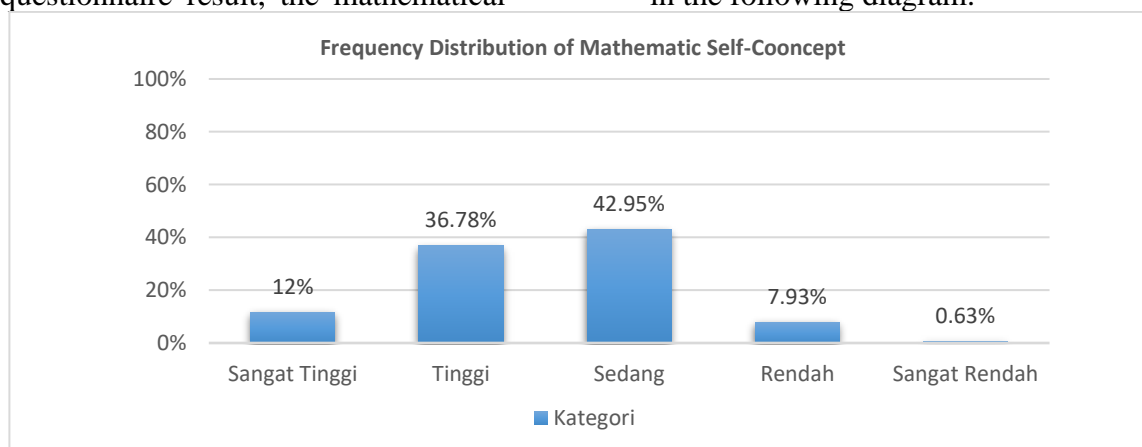


Figure 2. Frequency Distribution of Mathematic Self-Concept

Based on this result, it can be concluded that the understanding of mathematics self-concept of fifth grade elementary school students in Yogyakarta City and Bantul Regency is in the moderate category with a percentage of 42.95%.

3. Normality Test

A normality test is conducted to determine whether the sample comes from a population with a normal distribution. Normality test is performed by each variable. The technique used in this normality test is *One Sample Kolmogorov-Smirnov* test. Based on the normality test calculation results, it is obtained that the significance result between the variables of

mathematics learning experience and mathematics self-concept is 0.686. These results indicate that the significance value is > 0.05 . In accordance with the criteria, it can be concluded that the data are normally distributed.

4. Linearity Test

A linearity test is conducted to determine whether the relationship between independent variable and dependent variable is linear. The independent variable in this study is the mathematics learning experience and the dependent variable is the self-concept of mathematics. The relationship is said linear if the value of sig < 0.05 . Based on the table above, the result of linearity

test toward Mathematics learning experience variable on the self-concept shows the linearity significance value of 0.000. This result indicates that the significance value is $0.000 < 0.05$. Therefore, the independent variable of mathematics learning experience and the dependent variable of mathematics self-concept have a linear relationship.

5. Simple Linear Regression Analysis

Hypothesis test was carried out by simple linear regression analysis to see whether there was an effect between the mathematics learning experience (X) and mathematics self-concept (Y) in fifth grade elementary school students in Yogyakarta City and Bantul Regency. The value of the regression correlation coefficient (ρ) for the mathematics learning experience variable is 0.555 and the constant coefficient value is 18.459 thus the regression model obtained is $Y = 18.459 + 0.555X$

Y is the self-concept of mathematics, while X is the mathematics learning experience. The constant result of 18.459 systematically states that when the learning experience is 0, the self-concept has a value of 18.459. Furthermore, the positive value of 0.555 from the simple linear regression equation shows that the relationship between the independent variable (mathematics learning experience) and the dependent variable (self-concept) is unidirectional. It means that an increase in each unit of learning experience variable will cause an increase in self-concept of 0.555.

6. Significance Test

A significance test can be done by comparing the result value of $F_{count} > F_{table}$ and the value of p (Sig) < 0.05 . Based on the analysis

results of data significance test, it is obtained $F_{count} = 401.895$ with a value of p (Sig) = 0.000; with $F_{table} = 3.95$ thus it can be seen that the results of $F_{count} = 401.895 > F_{table} = 3.95$ and the value of p (Sig) = 0.000 < 0.05 .

7. Effective Contribution

Effective contribution is the effective ratio given to an independent variable to the dependent variable. To find out how much effective mathematics learning experience contributes to mathematics self-concept, it can be seen by looking at the results of R.

After r_{count} , 0.580, is known, the next step is finding out how much the effect of effective contribution of r^2 which is expressed in percentages. From the calculation results above, it can be concluded that there is an effect of the mathematics learning experience on the mathematics self-concept of fifth grade elementary school students in Yogyakarta City and Bantul Regency by 33.64%, while the rest ($100\% - 33.64\% = 66.36\%$) is affected by other factors not examined in this research.

CONCLUSIONS

Based on the research findings, it is found that the results of mathematics learning experiences for fifth grade elementary school students in Yogyakarta City and Bantul Regency are in high category with a percentage of 52.77%. The understanding of mathematics self-concept in fifth grade elementary school students in Yogyakarta City and Bantul Regency is in the moderate category with a percentage of 42.95% and there is an effect of mathematics learning experiences on mathematics self-concept in fifth grade elementary school students in Yogyakarta City and Bantul Regency. It is obtained that the independent variable is positive and unidirectional that is $Y = 18.459 + 0.555X$ with a significance value of 0.000. If the students' mathematics learning experience value is high, the self-concept

of mathematics will follow the experience (high) and vice versa. Furthermore, with contribution effective amounted to 33.64% and the remaining 66.36% was affected by other factors not examined in this study. This study can be used as a guide and a reference for further researchers in order to pay more attention to the time and number of samples taken.

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