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Do Elementary School Students Like Mathematics?

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Abstract— This study is aimed at describing the attitude of elementary school students toward mathematics. The research method used was survey. Respondents were 135 elementary school students consisting of fourth, fifth, and sixth-grade students. All respondents had received permission from their parents to participate in the study. Data were collected by using questionnaire. The results show that elementary school students assume that mathematics is a difficult subject. Respondents who gave spontaneous expression to mathematics with the word “difficult” amount to 38 students (27.74% of all respondents). They reason that mathematics has many formulas that must be memorized. In addition, the most difficult topic is volume because many formulas must be used to solve the problems related to volume. Interestingly, there are some students (13.14%) who consider learning mathematics fun because the material is easy to understand and the teacher is interesting. From the aspect of mathematics’ benefits, most respondents answer that learning mathematics is meaningful and useful in daily life, for example; to count money, buy and sell, count discounts, calculate area/land, measure weight, calculate volume, calculate distances, calculate farm yield, measure time, and train thinking and patience.

Keywords— mathematics, elementary school students.

I. INTRODUCTION

Students’ perceptions toward mathematics vary. Students may assume that mathematics is difficult or otherwise students may also like mathematics because mathematics is a fun activity [1]. In fact, learning mathematics is beneficial to daily life. Mathematics is useful in several activities, such as budgeting, understanding numerical data, making purchases, and others. [2]. Therefore, learning mathematics must be meaningful in order to make students realize the importance of learning mathematics for their life. Children’s real-life experiences in learning mathematics in the classroom are important to do to acquire meaningful learning

and quick understanding [3] because there is a correlation between students’ attitudes toward mathematics and mathematics learning outcomes [4].

This study aims to see the attitude of elementary school students toward mathematics. Previous research has investigated similar point but the research respondents are high school students, as the research by Marchis which focuses on factors that influence middle student attitudes toward mathematics [1]. Survey research was conducted by MPEX (Maryland Physics Expectation Survey) to look at mathematic dispositions in which the respondents were undergraduate students [5]. This research is expected to provide a more in-depth understanding of the elementary school student’s attitudes. This data can be used as identification and understanding of the problem. Therefore, it can be used as a material to analyze the factors that affect elementary school students’ attitude toward mathematics.

II. LITERATURE REVIEW

A. The Purpose of Learning Mathematics

Mathematics needs to be learned to provide students with the ability in 1) reasoning; 2) connecting; 3) problem solving; 4) communicating, and 5) representing [6]. The ability must be mastered so that students are able to use it as a provision to face the demands of times and needs in daily life. However, that ability will not be achieved if the student does not have a positive attitude toward mathematics. The success of students in learning mathematics is determined by students’ attitude toward positive mathematics. A positive attitude needs to be developed in mathematics because there is a significant correlation between students’ attitudes toward mathematics and student learning outcomes [1], [7-9]. This is particularly important at elementary school level, the level at which the foundation laid to construct various knowledge buildings. If the

elementary school has constructed the correct concept, then in the next tier they will not face too many difficulties in learning mathematics. As a result if students do not like mathematics, of course students tend to be lazy to learn mathematics. If students have been lazy to learn then the results of learning mathematics would not be satisfactory, and the purpose of learning mathematics will not be achieved.

B. Students' Attitude toward Mathematics

Attitude is a disposition or mental set which refers to a person's readiness to respond something as a basic psychological attitude in evaluating [10]. In the context of mathematics, attitude should be viewed as a decision to respond in a favorable or unfavorable way to mathematics [10].

Many research results show the correlation between attitudes and its relation to achievement in learning mathematics [9], [11]. The results showed that the method of learning mathematics and teacher's personality have a positive effect on students' attitude toward mathematics. Furthermore, teachers who give less attention to students and have lack of personal effort in teaching mathematics affect the unsuccessful learning outcomes [12]. Generally or most of the students tend to dislike mathematics compared to other subjects [13]. Nevertheless, mathematics is a subject that must be learned by students at all levels including in elementary school. Therefore, teachers should give attention to student's attitudes aspect because the positive attitude will give the positive impact on the students' success. Attitude toward Mathematics is important for students because when students have a positive attitude toward mathematics, then he believes that the mathematical knowledge that he gained will support a career in his life in the future.

III. METHOD

A. Method

This study is a survey, and it aims to see the elementary school students' attitude toward mathematics. A questionnaire was used to collect data. The questionnaire consisted of 6 questions about students' attitudes toward mathematics. Researchers collected data by giving direct questionnaire to the respondent. With the guidance of classroom teachers and parents, respondents were given 15 minutes to fill the prepared questionnaire. School samples were taken at random and given a letter of willingness as a sample school.

B. Respondent

The number of respondents in this study was 135 students in Madiun District, Indonesia consisting of fourth, fifth, and sixth grade from different schools. Age of respondents were in the range of 10/11 years old up to 12/13 years. The information on respondents is presented in chart below.

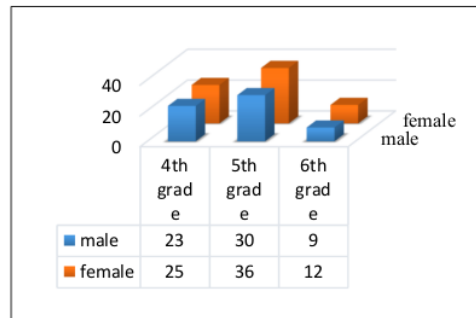


Fig. 1. The details number of respondents

From the chart, the respondents consisted of 4th grade (48 students), 5th grade (66 students), and 6th grade (21 students). There were 73 female students and 62 male students. As many as 47 students came from the urban area and the rest are students from the village. Furthermore, all respondents had received permission from their parents to participate in the study.

C. Instrument

The instrument in this study was a questionnaire on attitudes toward mathematics adopted from a questionnaire made by Maryland Physics Expectation Survey (MPEX) and then modified in accordance with elementary school students, because the instrument was used for college level. By modifying the existing questionnaire, it made it easier for primary school students to fill it.

IV. RESULTS & DISCUSSION

A. Result from "One Word Question"

The questionnaire is asking students to describe mathematics in one word. The goal is to know the students' spontaneous expression of mathematics. The table below is students' response to the question.

TABLE I. RESULT RECAPITULATION ON ONE WORD QUESTION

Word	Frequency		students	
	frequency	Percent	female	male
Difficult	38	27.74 %	10	28
Fun	18	13.14 %	16	2
Complicate	16	11.68 %	8	8
Thinking	12	8.76 %	10	2
Formula	10	7.3 %	6	4
useful	6	4.38 %	4	2
confuse	6	4.38 %	2	4
challenging	5	3.65 %	3	2
Easy	4	2.92 %	3	1
Hate	3	2.19 %	1	2
frustrate	3	2.19 %	1	2
diligent	3	2.19 %	2	1
need	3	2.19 %	3	0
others	8	5.84 %	4	4
Percentage			54%	46%

The word "difficult" is the response most respondents give (38 students or 27.74% of the total). Then the word "fun" comes second with 18 students or 13.14% of the total, and so on until the word "need", "others" in the table refers to another word and very few respondents choose the word, for example scary, boring, numbers, wow, dislike. The interesting thing here is that sex factors have a tendency toward mathematics. Based on the results of the analysis, girls are more interested in mathematics, it is seen from the response of respondents who answered with the word "fun". A total of 16 female students responded with the word, while there are only 2 male students. In addition, respondents who answer with the words "rationale", "useful", "challenging", "easy", "diligent", and "needs" are dominated by female students. One of the factors influencing student attitudes toward mathematics is gender factor, the others are, social status, and previous mathematical achievement [14].

The questionnaire given to the students also explores students' reasons in describing mathematics. By filling the item, we know the reasons for student's attitude toward mathematics. In general, students' answers are summarized in the following table.

TABLE II. REASONS STUDENTS' RESPOND TOWARD MATHEMATICS AND TEACHER

reason	Frequency	percent
Teacher is fierce	8	5.93%
The material is difficult	57	42.22%
Mathematics has many formulas	35	25.93%
Mathematics is challenging	5	3.7%
The material is easy	30	22.22%

From the recapitulation result, the most reason given by the students is that mathematics material is difficult to understand (57 students or 42.22%). The elusive material has many factors. It could be due to less innovative learning methods, less precise material delivery, not using learning media, less mathematical activities in learning, less consideration for students characteristics, and etc. The "teachers" factor also influences students' attitudes toward mathematics. The most important thing to be noticed for teacher nowadays is the paradigm shift from the teaching paradigm to the learning paradigm [15].

The second most given reason is mathematics has many formulas for students to memorize (35 students or 25.93%). Thus, it burdens students by a substantial formula even though mathematics is meaningless if memorized [16]. The mathematical learning that occurs is the students rely on the ears and eyes, then try to memorize what the students see and hear and they don't focus on solving problems. In other words,

the existing problem of mathematics learning is that students tend to memorize more formulas, solve problems related to the given formula rather than solve the problem with the steps that should be done in solving a mathematical problem. In addition, as many as 8 students (5.93%) answer why they find mathematics difficult is because the teacher is fierce.

The results of an interesting analysis are that there are students who really interested in mathematics and they feel that it is challenging to solve mathematical problems. In addition, students also find the math materials are easy to understand. The average students who are interested in mathematics are the student who responds with a positive attitude toward mathematics on "one-word question".

B. The difficult material of Mathematics

The scope of material in primary schools includes numbers, geometry and measurement, and data processing. From the diagram, it is divided into several materials that must be mastered by students. Beside a one-word statement to describe mathematics, the questionnaire also asks about material that students feel difficult to learn. Based on the diagram below, we can see and map the difficult materials, according to students' opinion.

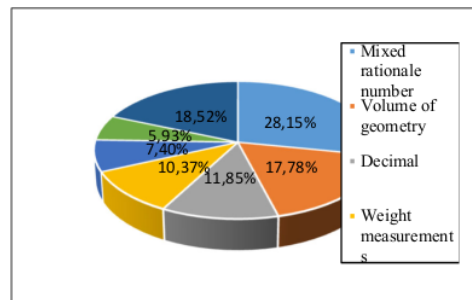


Fig. 2. Recapitulation data of Difficult Materials of Mathematics

From the data obtained, the mixed rational number is considered by 38 out of 135 students (28.15%) as the most difficult material. The characteristics of the mixed rational number containing the sum, subtraction, multiplication, and division are difficult to associate with daily-life context. Therefore, it is difficult for students to link the concept of mixed rational number to the context of daily life problems. The decimal numbers which have almost the same characteristics as the mixed rational numbers are considered difficult by 11.85% of the respondents.

The next material that is considered the most difficult material by students is the volume of geometry. A total of 24 students (17.78%) answers that mathematics is a difficult material. The problem arises when teacher gives the formulas directly without context. Students obtained formulas first then

they have to work hard to memorize the volume formula of each geometry.

The next difficult materials are weight measurement (10.37%), time measurement (7.4%), division (5.93%), and other materials (18.52%). In general, students say that those materials are difficult to understand and confusing. "Teacher" factor becomes an important factor. The experience of teachers in mathematics learning is very important because it affects teachers' perceptions and innovation practices in the curriculum. Those three have close relationships where the teacher's experience will affect teachers' perceptions toward learning, and varied learning [17].

C. The useful of Mathematics in Daily life

Mathematics must be meaningful for students. Meaningful learning will give students an awareness that mathematics is important to learn. To see if the material students learned in the classroom is beneficial for students, the questionnaire also explores students regarding the benefits of mathematics in daily life. The data obtained in the accumulation and presented in the following table.

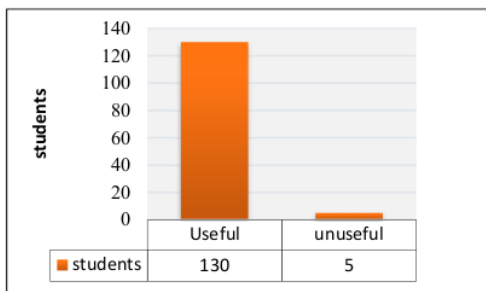


Fig. 3. The recapitulation of data about the Benefits Mathematics

As many as 130 students (96.3%) state that mathematics benefits their life. In other words, the mathematics that they learn in school has benefits in daily life. Students say that mathematics has benefits in some aspects; to count money, buy and sell, count discounts, calculate area/land, measure weight, calculate volume, calculate distance, calculate agricultural output, measure time, train thinking and patience. Based on Hassenney, mathematics is useful in budgeting, understanding of numerical data, buying and selling, and other activities in life [2].

As many as 5 students (3.7%) say that mathematics is not useful. This is a question that must be answered and studied more deeply why students answer it. Practice of mathematics learning in primary school refers to behavioristic learning, besides the students are required to record and remember (memorize) the formula written by the teacher on the board. The teacher then gives an example of how the formula is useful through examples of using formulas

to solve problems, then students are asked to use the formula as a tool for solving problems, but the questions asked to do are similar to the examples. As a result, students have difficulties in solving problems that are slightly different from the examples given by teachers. With such circumstances, then when students are not successful in solving the problems will cause loss of confidence. In the end the students only focus on the problems so as to put aside the meaningfulness of learning mathematics in everyday life.

V. CONCLUSION

This study provides an illustration that students' attitudes toward mathematics are diverse. However, based on the available data, most students consider mathematics as difficult subject. However, some students consider mathematics fun because the mathematical material is easy to understand and the teacher is fun. Factors affecting mathematics difficult to understand are: many formulas that must be memorized by students, the role of parents [18], teacher motivation [19], classroom instruction [20], social status, gender, and previous mathematical achievement [14]. The interesting thing about this study is that most students who are interested in mathematics are female. This is in accordance with the results of research conducted Davadas et al [14].

Students consider mathematics meaningful and useful in everyday life, for example to count money, buy and sell, count discounts, calculate area / land, measure weight, calculate volume, calculate distance, calculate farm yield, measure time, and train thinking and patience. Teachers must conduct innovation in teaching mathematics in elementary school to make it fun and more meaningful. Meaningful mathematical learning will make students love mathematics. When students love mathematics, the students will have a passion for learning mathematics. Positive student attitudes toward mathematics will give a significant impact on mathematics learning outcomes [21].

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