Attitude towards Mathematics of Civil Engineering Students

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Abstract. This study aims to determine the attitudes towards the mathematics of civil engineering greek students at Unika Santu Paulus Ruteng. The type of this research is descriptive research with a survey method. This research was conducted at the Civil Engineering Study Program, Unika Santu Paulus Ruteng. The research population in this study were all civil engineering study program students. The sample is part of the number and characteristics possessed by the population. Therefore, the model in this study was new students for the 2022/2023 academic year, with as many as 57 people. Data were collected using a questionnaire. The results of the study obtained a percentage of (87.7%) for the aspect of Confidence about mathematics, (77.2%) for the aspect of Confidence in mathematics, (66.7%) for the Fun aspect of learning mathematics, and (57.9%) for the Tendency to do things related to math problems. So, the conclusion is that the attitude towards the mathematics of Civil Engineering Study Program students is classified as moderate.

Keywords: attitude, mathematics, students

1 Introduction

Education is an important problem for humans because it involves human survival and the nation's intelligence level. One of the sciences that play an important role in life is mathematics, where mathematics is an important component basis for other fields of science. The study of mathematics is very important in every country of the world. Students are required to learn mathematics which is regarded as a primary education since the skill of mathematics computation is essential in every walk of life [1]. Therefore, researchers think it is necessary to find out things that can support student success in mathematics.

One of them is the attitude towards students' mathematics. The affective aspect greatly influences students in the learning process. Attitudes towards mathematics related to responses, interests, appreciation, and so on are part of students' self that can affect the learning process. Therefore, researchers think it is necessary to find out things that can support students' success in learning mathematics. Students' attitudes towards mathematics significantly influence their achievement [2].

Although attitudes towards mathematics can improve mathematics learning achievement, it has yet to receive serious attention in learning mathematics. Historically, teaching mathematics at lower has only sometimes allowed students to develop better tendencies toward the subject. Most students who are mentored need a better perception of the difficulty of mathematics as a subject that must be studied [3]. Historically, teaching mathematics at lower primary and secondary education levels has only sometimes allowed students to develop better

tendencies toward the subject. Most students who are mentored need a better perception of the difficulty of mathematics as a subject that must be studied. This indicates that some students do not like learning mathematics.

Therefore, in learning mathematics, affective aspects, especially attitudes towards mathematics, need serious attention from the teacher so that attitudes towards mathematics receive attention from students and that learning objectives can be achieved according to what is expected. Attitude is a very important variable in learning mathematics because students with positive attitudes towards mathematics tend to show higher mathematical abilities than students with negative attitudes towards mathematics.

In the field of civil engineering, mathematics has a very important role in studying courses in the field of civil engineering. Students of the civil engineering study program come from various major backgrounds at the previous education level. Thus, researchers seek to obtain information about students' attitudes towards mathematics so that they can find solutions in finding problems in studying mathematics. This study aims to describe attitudes towards the mathematics of new students in the civil engineering study program for the academic year 2022/2023.

2 Method and Materials

Attitude towards mathematics is a positive or negative emotional feeling towards mathematics [4] states; that there are three reasons why students' attitudes towards a subject need to be improved. First, students' attitudes toward a matter appear to be related to their achievement in that subject. Second, students with positive attitudes towards mathematics will likely have the initiative to deepen their knowledge and learning about mathematics. Third, attitudes are often communicated to peers in various ways throughout life. The indicators in attitudes towards mathematics according to [4] are as follows (1) Beliefs about mathematics, (2) Confidence in math, (3) Fun of learning math and (4) Tendency to do things related to math problems. This type of research is descriptive research with a survey method. Descriptive study is conducted to determine the value of independent variables, either one or more variables, without comparing or connecting one variable to another [5]. This research was conducted at the Civil Engineering Study Program, Unika Santu Paulus Ruteng. The research population in this study were all civil engineering study program students. The sample is part of the number and characteristics possessed by the population. Therefore, the sample in this study was new students for the 2022/2023 academic year, with as many as 57 people. Data were collected using a questionnaire with a rating scale as follows:

Table 1. Likert scale table

The answer choices	The nature of statements	
	Positive	Negative
Strongly agree	4	1
Agree	3	2
Disagree	2	3
Strongly Disagree	1	4

Source [6]

Statistical descriptive data analysis, the data can be categorized by using the formal categorization cited by [8] as follows:

$$X < (\mu - 1,0.\sigma) \qquad \text{low}$$
$$\mu - 1,0.\sigma \leq X < (\mu + 1,0.\sigma) \qquad \text{medium}$$
$$\mu + 1,0.\sigma \leq X \qquad \text{high}$$

Description:

X: total score obtained

μ : theoretical mean

σ : population standard deviation unit

The results of the categorization percentages are obtained, and the percentage values are converted using the table below:

Table 2. Achievement percentage category

Percentage (%)	Category
0-19,99	very not good
20-39,99	not good
40-59,99	enough
60-79,99	good
80-100	very good

Source [7]

3 Results and Discussion

This study aims to determine attitudes towards mathematics Engineering Civil study Program Students. This study has four indicators and 11 sub-indicators with 39 items statements with a sample of 57 civil Engineering Education Study Program students. Description of this research data about attitude data towards mathematics Study Program students Civil Engineering Research result data analyzed using Microsoft Excel 2010 and SPSS version 17.0. Based on indicators, the description of research data is as follows.

Beliefs about mathematics

Data on beliefs about mathematics can be seen in the following table:

Table 3. Belief on Mathematics

		Indicator 1
N	Valid	57
	Missing	0
Mean		18,68
Median		19,00
Mode		19
Std. Deviation		1,660
Minimum		15
Maximum		23
Sum		1065

Results categorization of Beliefs about mathematics

Table 4. Results categorization of belief in mathematics

Number	Interval	Categorization	Frequency	Percentage
1	$X < 14$	low	0	0%
2	$14 \leq X < 21$	medium	20	87,7%
3	$21 \leq X$	high	7	12,3%
		amount	57	100%

Confidence in math

Data about can be seen in the table Confidence in mathematics

Table 5. Confidence in mathematics

	Indicator 2
N Valid	57
Missing	0
Mean	42,63
Median	43,00
Mode	43
Std. Deviation	3,529
Minimum	35
Maximum	51
Sum	2430

Table 6. Results categorization of Confidence in mathematics

Number	Interval	Categorization	Frequency	Percentage
1	$X < 30$	low	0	0%
2	$30 \leq X < 45$	medium	44	77,2%
3	$45 \leq X$	high	13	22,8%
		amount	57	100%

The Fun of learning math

Data on the pleasure of learning mathematics can be seen in the following table:

Table 7. The Fun of learning math

	Indicator 3
N Valid	57
Missing	0
Mean	25,77
Median	26,00
Mode	26
Std. Deviation	2,934
Minimum	12
Maximum	33
Sum	1469

The results of the categorization of Fun in learning mathematics can be seen in the following table:

Table 8. The Fun of learning math categorization

Number	Interval	Categorization	Frequency	Percentage
1	$X < 18$	low	1	1,7%
2	$18 \leq X < 27$	medium	38	66,7%
3	$27 \leq X$	high	18	31,6%
		amount	57	100%

Tendency to do things related to math problems

Data on the Tendency to do things related to math problems can be seen in the following table:

Table 9. The Tendency of math problems

	Indicator 4
N Valid	57
Missing	0
Mean	23,19
Median	23,00
Mode	23
Std. Deviation	2,108
Minimum	18
Maximum	29
Sum	1322

Discussion

Beliefs about mathematics

The indicator of beliefs in mathematics obtained a categorization value of 87.71% (moderate category). This result means that the Civil Engineering Study Program students have met the minimum mark in Mathematics. The discussion of the sub-indicators of belief in mathematics in the Civil Engineering Study Program is as follows: a. the idea that mathematics can be helpful in civil engineering. This sub-material obtained a categorization value of 91.22% (moderate category). This illustrates that civil engineering study program students already understand the material in the Mathematical Matriculation course, although some students have not mastered the mathematical matriculation material. b. the usefulness of mathematics in student work later obtained a categorization value of 59.6% (high category). The result of this research is in line with the present investigation provided by [8], who reported that the majority of 40.5% of the respondents think they have a positive tendency to agree with the beliefs towards mathematics. In contrast, some students in the Civil Engineering Study Program still believe that mathematics is less useful in their future work.

Confidence in learning mathematics

An indicator of Confidence in mathematics obtained a categorization value of 77.2% (moderate category). This illustrates that civil engineering study program students have good Confidence in learning mathematics. The discussion of sub-indicators of Confidence in learning mathematics in the civil engineering study program is as follows: a. express ideas in solving mathematical problems. This sub-indicator obtains a categorization value of 50.9%

(high category). Civil engineering study program students are still not optimistically expressing ideas in solving mathematical problems. b. have Confidence when learning mathematics. The sub-indicator of activeness in expressing opinions was obtained with a categorization value of 66.7% (moderate category). It can be seen that civil engineering study program students like to participate in working on math problems. c. Confident in competing with other friends. This sub-indicator obtained a categorization value of 68.4% (high category). This shows that students have Confidence that they can compete with one another. d. confident in the face of failure and success in mathematics. This sub-indicator obtained a categorization value of 66.7% (moderate category). It can be concluded that students accept failure and success in learning mathematics well, even though there are some who do not understand certain sub-themes of the material. Self-confidence (usually termed Confidence) refers to self-belief about abilities to do and learn mathematics in some context, not necessarily generally. Hence a learner may be confident within one area of mathematics, but the other may not [9].

The Fun of learning math

This indicator obtained a categorization value of 66.7% (medium category). This illustrates that students enjoy learning mathematics. The discussion of the sub-indicators of the pleasure of learning mathematics is as follows: a. enjoy taking math classes. This sub-indicator was obtained with a categorization value of 73.7% (high category). This shows that students of the Civil Engineering Study Program often attend mathematics lectures in an orderly manner. b. Looking for other references about mathematics in the library and on the internet has a categorization value of 94.7% (high category). This shows that students of the Civil Engineering Study Program study mathematics not based on one source only (lecturers); students also learn from other sources, especially YouTube. c. Develop mathematical abilities—this sub-indicator with a categorization value of 77.2% (medium category). The student's feelings of pleasure indicated the Fun of learning mathematics during mathematical learning and the inner motivation to have further learning endurance [10].

Tendency to do things related to math problems

The indicator of the Tendency to do related things obtains a categorization value of 57.9% (moderate category). This shows that civil engineering study program students have less Tendency to do something related to math problems. The sub-indicator does much work related to mathematics, obtaining a categorization value of 71.9% (moderate category). This illustrates that students of the Civil Engineering Study Program still do enough things related to mathematics. In addition, the sub-indicator of developing mathematical abilities obtained a categorization value of 80.7% (moderate category). This illustrates that civil engineering study program students still need to improve their mathematical abilities. Students experienced difficulties in learning mathematics, thus unable to solve challenging questions and cannot see the application of mathematics in daily life [11].

4 Conclusion

The results of the study obtained a percentage of (87.7%) for the aspect of Confidence about mathematics, (77.2%) for the aspect of Confidence in mathematics, (66.7%) for the Fun aspect of learning mathematics, and (57.9%) for the Tendency to do things related to math

problems. The conclusion is that the attitude towards the mathematics of Civil Engineering Study Program students is moderate.

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