Percentage of Understanding Concepts Functions of Vocational High School Class X Nurul Huda Panarukan Situbondo

Arika Indah Kristiana¹, Eko Waluyo², Ridho Alfarisi³, Raharjo Pujiantoro⁴

¹Departement of Education Mathematics, University of Jember, Jember, Indonesia <u>arika.fkip@unej.ac.id</u> ²Departement of Education Mathematics, Islamic Institute of Zainul Hasan, Probolinggo, Indonesia <u>ekocasper29@gmail.com</u> ³Departement of Primary School, University of Jember, Jember, Indonesia <u>alfarisi.fkip@unej.ac.id</u> ⁴SMK of Hurul Huda Panarukan , Situbondo, Indonesia raharjopujiantoro@gmail.com

Abstract: Vocational students are expected to understand the basic mathematical concepts. Because vocational students should be able to apply the appropriate mathematical material selected majors. There are some students who have feel that is difficult to understand the mathematical concepts. According to the NCTM, there are seven components in understanding mathematical concepts

Keywords— conceptual understanding, the definition of function

1. INTRODUCTION

Structurally, education in Indonesia is the responsibility of the Ministry of Education and Culture of the Republic of Indonesia (Kemendikbud). Every Indonesian citizen has the right to education, with elementary education, secondary education, and higher education. In secondary education is applied for three years, which consists of two types, namely, public education (SMA) and vocational education (SMK). Vocational education is secondary education that prepares students primarily to work in a particular field.

In the Indonesian Government Regulation No. 70 in 2013, Curriculum 2013 aims to prepare people to Indonesia in order to have the ability to live as individuals and citizens who believe, productive, creative, innovative, and effective and able to contribute to society, nation, country, and world civilization. Mathematics is one of the compulsory subjects in the group and all the majors in Vocational High School, and there was mathematics. This is why the demands of vocational high school students are expected to understand the mathematics concepts. The importance of mathematics at each level of education in Indonesia, especially in vocational schools, is expected that learners can understand a mathematical concept that can be applied to selected fields.

Conceptual understanding is knowledge of the relationship or the basic idea of a topic. For example, consider the task of multiple. Conceptual understanding of this problem include ideas like that multiplication is repeated addition, and the problem may represent a rectangular area with dimensions of 47 inches wide and 21 inches (Walle, 2007). Understanding the concept according to Walle (2007), (1) defining the concept of verbal and written, (2) identified and create examples and are not examples, (3) using models, diagrams, and symbols to present a concept, (4) changing a form of representation to other forms, (5) know the various meanings and Interpretations of the concept, (6) identified the properties of familiar concepts and terms that define the concept, and (7) compare and contrast the concepts.

2. RESEARCH METHODE

This study was a descriptive study, through the following steps: (1) introduction, (2) data collection, (3) data analysis, and (4) conclusion. The subjects were students of class X SMK Nurul Huda Panarukan Situbondo, Indonesia. Data collection method used is the test method. The steps in the data analysis of the percentage of students who meet the following indicators.

1. Calculating the percentage of students who achieve the concept of understanding based indicators NCTM by the formula:

$$I = (S/Ns) \times 100\%$$

Information:

I = Indicators understanding of the concept by the NCTM

S = Students who have an understanding of the concept of each indicator is greater equal to 50%

Ns = Many students in a classroom learning

2. Categorizing indicators of understanding of the concept according to the following table:

Table 1 Category indicator of understanding of the

concept		
Value of Indicator	Categorize	
(%)		
$0 < I \le 35$	yet Reached	
$35 < I \le 75$	Sufficiently Reached	
$75 < I \le 100$	Reached	

3. RESULT AND DISCUSSION

The results of the data analysis the percentage of students of class X SMK Nurul Huda Panarukan Situbondo, Indonesia that meet the indicator of conceptual understanding as follows: Indicators conceptual understanding of the percentage of students who are the highest for the concept of a function is an indicator that defines the concept verbally and in writing and identifies the properties of a concepts and knows the terms that define a concept. While the lowest are indicators that compare and contrast concepts.

 Table 2 Percentage of Conceptual Understanding of Students Indicators

No.	Indicators Conceptual	The percentage of
	Understanding	students
1	Defining the concept of verbal	100
	and written	
2	Identified and create examples	74.29
	and are not examples	
3	Using models, diagrams, and	65.71
	symbols to present a concept	
4	Changing a form of	71.43
	representation to other forms	
5	Know the various meanings	65.71
	and Interpretations of the	
	concept	
6	Identified the properties of	100
	familiar concepts and terms	
	that define the concept	
7	Compare and contrast the	51.43
	concepts	

Indicator 1 (Defining the concept of verbal and written) and indicators 6 (identifying properties of a concept and see the terms that define a concept) the percentage of students who obtained 100% means that all students are able to define the concept of function verbally and in writing and be able to identify the concept of natural function, it is because the concept and nature of the functions can be memorized.

Indicator 3: Income from the sale of each piece of fabric is determined by the formula 500x + 900 (in thousands of rupiah).

- (a) If within three days the traders can sell 65 pieces of cloth, 80 pieces of cloth, and 75 pieces of cloth in order, how many benefits in 3 days?
- (b) Draw the answer points (a) on a Cartesian graph. Give conclusions about the answer points (a), whether including or not working?



Figure 1. Answer Students for indicator 3

Indicator 3 (Using models, diagrams, and symbols to present a concept) is given a test sample in Figure 1. In Figure 1, the student is able to present the ordered pair in graph form and in the form of an arrow diagram. This is in contrast to the responses of the student's indicator 4 (Changing a form of representation to other forms). Figure 2 describes the students are not able to distinguish the relationship as a function or not. The problem that is converted into a function the students are not able to finish.



Figure 2. Answer Students of indicator 4

Indicator 7 (Compare and contrast the concept) of 51.43% means that the percentage of students who are less able to compare and contrast the concept of function. This is because in comparing the concepts, students should be able to associate the material with the functions of the previous material suppose relations.

Indicator 7: Make two sets, then make rules are rules the relation that connects the two sets, then serve in a graph and determine the relationship as a function or not.

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Figure 3 Answer Students for Indicators 7

Figure 3, students can not distinguish the functions and relations, answers students simply connect the city with typical food, so that students can not be present in graphic form.

The reason students choose a vocational school because they want to get a job after completing their studies. Due to prioritizing vocational practice rather than material. So that vocational students are not paid much attention to the basic concepts of mathematics. Yet through the correct understanding of mathematical concepts, the students will be easier to apply mathematical concepts in everyday life or areas of interest of the students selected. As recommended by the NCTM for the function of the material, the student middle school level, students are expected to generalize patterns by using functions defined explicitly and recursively, and understand relations and functions and choose, modify and use a different expression for the function.

4. CONCLUSION

Understanding the concept of vocational students was limited to the definition and nature of the functions only, students do not really understand but just memorize some indicator of conceptual understanding, The students do not meet. Percentage of understanding the concept of vocational students Nurul Huda Panarukan Situbondo still categorized as sufficiently reached. Through an innovative learning model that vocational students are expected to understand mathematical concepts.

5. ACKNOWLEDGMENT

The preferred spelling of the word "acknowledgment" in America is without an "e" after the "g." Avoid the stilted expression "one of us (R. B. G.) thanks .". Instead, try "R. B. G. thanks.". Put sponsor acknowledgments in the unnumbered footnote on the first page.

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