The Analysis of Students Difficulties In Understanding Basic Math Concept At the Second Grade of MTsN Balang-Balang

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Abstract— The study aims to find out the students' difficulties in understanding basic math concept at the second grade of MTsN Balang-Balang and to know the factors causing the students' difficulties in understanding math concept at the second grade of MTsN Balang-Balang of Gowa Regency. This study is qualitative research. The instruments used in this study are preliminary or categorization test, diagnostic test and interview. Data analysis techniques used are data reduction, data description, research objective analysis and drawing conclusion. The study findings show that understanding difficulty is categorized as high of those three other types and the factors causing the students' difficulties in understanding mathematical concept consist of two factors namely external and internal factors.

Keywords— studying difficulty, understanding concept

I. INTRODUCTION

Education is basically a process to help human beings in developing their self-potential in order to be able to face any changes, and to develop educated human beings, it needs human resource development. Therefore, education is very necessary to be considered by all components started from the government, society, and education managers in particular. The education purpose in Indonesia is focused on the capability development and character formation as well as dignified civilization nation in order to educate the society's life, which aims to develop the students' potential to become human beings who believe and pious to the Almighty God, glorious, healthy, knowledgeable, skilled, creative, independent, and become democratic and responsible citizen. Therefore, it needs good quality education to create quality educational process. The achievement of learning math tends to be lower if it is compared with other learning materials, due to some obstacles found in learning math. This is because some students have the perception that math lesson is difficult to learn, less fun, and difficult to memorize the math formulas. It is possible because of a lack of students' understanding of the math concepts [1]. Perception is personal direct response through a complex

process of receiving and interpreting an object using the senses [2]. Learning difficulty is a condition signed by the presence of certain obstacles that cause unsuccessful learning objectives [3]. The success of teaching and learning process can be measured from the students' successes who participate in the learning activities. The success can be seen from the understanding level of the material and the students' achievement. The higher the material understanding and the students' achievement, the higher the learning success will be. In learning math, it needs conceptual understanding as the basis for further material development. The conceptual understanding is the mastery of the number of learning materials in which the students not only recognize and know, but also are able to re-express it in easily understandable language as well as able to implement it [4][5]. The conceptual understanding is the necessary part in learning math. It is stated by Fazilah and Wibowo that math lesson emphasizes on the concept, it means that in learning math, the students have to understand the math concept first in order to answer the test or math exercises and able to implement the learning in the real life [6]. Based on the observation result conducted by the researchers on one of MTs in Gowa district, the researchers found that some students were lack of understanding in the math concept. It causes by the students' lack of learning attention or interest during the learning and teaching processes. Although the teachers had made various efforts such as using a variety of learning math models, methods, and strategies, there were still many students got difficulties in understanding the math lesson. To improve the quality of education, absolutely, it cannot be separated from the learning and teaching process as the main activity in the school. One of the very influential factors in the learning and teaching activities is the quality of conceptual understanding given by a teacher. Therefore, a teacher should have competence in giving understanding about math concept both by right method, model, and strategy. In addition, the students have to play an active role in the learning and teaching process.

Based on the above explanation, it shows the students' low understanding of math concept affecting to the students' low learning achievement, so that it should be studied more detail about the students' difficulties in understanding the math concept and the factors causing those difficulties.

II. RESEARCH METHOD

The study used qualitative research. The study was conducted in MTsN Balang-Balang of Gowa Regency. The research subject was all the second grade students of MTsN Balang-Balang which were divided into three categories. Those categories are: the students with high category ($80 < x \leq 100$), middle category ($65 < x \leq 80$), and low category ($x \leq 65$). There are three kinds of instruments used in this study such as, category determination test, diagnostic test, and interview guidelines. The determination test was given to the students who would be categorized based on the test result in the form of test with algebraic materials. The diagnostic test was given to the students who had been categorized. The data obtained from those instruments then were analyzed. Those data were analyzed through four steps such as: data reduction, data description, the analysis of research objectives, and drawing conclusion.

III. RESULTS AND DISCUSSION

a. The Data Resulted from Category Determination.

After conducting the initial test to 226 students, those students are divided into three categories. The high category is as many as 13 students, the middle category is as many as 15 students, and low category is as many as 198 students. From the categorization, the researcher limited 13 students for each category who were given diagnostic test to measure the students' ability in understanding the concept. The researcher limited 13 students for each category to minimize the research subject to be examined on the diagnostic test.

b. The Data Resulted from Diagnostic Test.

The diagnostic tests were given to 13 students from all categories. The diagnostic test is in the form of basic math test as many as 10 Essay test items. The researcher then selected 2 subjects representing all difficulty aspects of conceptual understanding namely, fact understanding, concept understanding, the difficulty in using basic operation, and principle understanding for in-depth interview.

The following addresses some difficulties experienced by the students by looking at the mistakes made in answering the test and the cause of the difficulty on the test item number 1 (fig.1)

a   b   c

Based on the above students' answers, it shows that: a.) the student of K1.S1 completed the given test by using the calculation process in accordance with the concept of even number calculation, but the student was wrong on the calculation process of the test 1b. It proves that K1.S1 student's difficulty lies in the difficulty in using the calculation. It can also be seen from the example above that K2.S4 student completed the given test by using inappropriate calculation process with the concept of even number calculation. For the test item number 1a, the student answer the test without following the appropriate calculation process, in which the first step in answering the even number.

calculation started from multiplication and division then followed by addition and subtraction. For the test item number 1b, the completion step had been correct but the student was wrong in the calculation process. The student did not pay attention on the sign 'b'. Furthermore, it can be seen from the example that K3.S2 student completed the test by using wrong calculation. Similarly with K2.S4 student for the test item number 1a, the student did more on the reduction operation than division calculation. The student did the test by using wrong operation in which the student did not pay attention on the operation so that the student generalized using one kind of operation namely addition operation. As what stated on the above example, the student summed up all operations that should be divided and multiplied.

c. The Data Resulted from the Interview

The following are the findings of interview on one of the selected subjects namely K1.S1 (high category of the subject). The difficulties experienced by K1.S1 are the difficulties in understanding the facts, difficulties in understanding the concepts, and difficulties in understanding process and operation as well as the difficulties in understanding principles.

The student had difficulty due to two factors, external and internal. The internal factors such as lack of confidence so that the student was embarrassed to ask the teacher about the material that he did not understand in the learning and teaching process in the classroom and the numerical ability affects the mathematics learning outcomes [7]. His friends' words became frightening specter for him if he asked the teacher about the previous materials or the materials that had not been understood, while the external factors including the pedagogic factor which means that the teacher teaching methods were monotonous in the classroom so that the student had difficulty in understanding the materials taught by the teacher.

The student who had difficulty in understanding the facts, in understanding in operating and processing the calculation, and in understanding the principles was the student who had difficulty in understanding the concepts in which the concept would be easily understood when the student mastered the learning materials which means

that the student not only knew the material but also was able to implement it.

Based on the result of the percentage analysis of all types of the student's difficulty, it was found that the student's difficulty in understanding the math concept was categorized as high of those three other factors. The percentage of student's difficulty in understanding the math concept was 78%, while three other factors were under 78%. It can be concluded that the difficulty in understanding basic math concept at the second grade of MTsN Balang-Balang is categorized as high.

The difficulties in understanding the concept namely the difficulties experienced by the students in comprehending the actual concept. The students have difficulty in understanding the operation concept of even number calculation, algebraic calculation, arithmetic calculation, line and angle calculation, comparisons, and widespread and circumferential calculations on the basic math. Those findings further clarify what Ausubel has said that the learned math lesson should be meaningful, which means that the instructional materials should be appropriate with the students' ability and cognitive structure. On the other words, the new math lessons need to be linked to the existing concepts so that the new concepts are well comprehended [8].

The causes of the difficulties experienced by the students are too many math concepts that the students are difficult in mastering those concepts. In addition, the students do not really pay attention to the teacher's explanation in the classroom. The number of other tasks makes the students rarely repeat the lesson at home except for the homework.

The internal factors consist of the matters relating to the students' intellectual abilities and the students' ways in processing or digesting the math materials into their minds. The factors causing the difficulties in learning math are: a) lack of students' understanding in the prerequisite materials both characteristics, formulas, and processing procedures; b) forgetting the related formulas to be used in answering the tests; c) lack of interest in the math lesson or the students' un-seriousness in participating in the math lesson; d) unwell prepared students (the students did not study even they have test and examination); e) hurry in answering the test; and f) less thorough in answering the test, whereas, the external factors are the teacher's way or method in teaching, school environment, and family.

IV. CONCLUSION

Based on the obtained study and discussion, it can be concluded that the difficulty in understanding the basic math concept at the second grade students of MTsN Balang-Balang is categorized as high. It is based on the percentage analysis result of all difficulty types experienced by the students. It is found that the students' difficulty in understanding the math concept categorized as high due to those three other types. The factors causing the difficulty in understanding the concept consist of internal and external factors. The internal

factors include intellectual factor, health disturbance, emotional factor, interest, and learning concentration, while the external factors include the pedagogic which means the teacher way or method in teaching, social factor, and economic factor of parents.

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