



Analysis Of Mathematical Misconceptions On The Place Of Enumerated Numbers Of Grade II Elementary School Students

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Abstrak

Penelitian ini bertujuan untuk mengetahui Miskonsepsi Matematika pada Tempat Bilangan Cacah Siswa kelas II. Penelitian ini dilakukan di kelas II SDN Kebaharan 1 Kecamatan Serang. Penelitian ini menggunakan metode deskriptif kualitatif. Sumber data pada penelitian ini adalah siswa kelas IIB. Subjek penelitian yaitu siswa kelas IIB. Teknik pengumpulan data melalui tes esai, wawancara, dan dokumentasi. Keabsahan data penelitian menggunakan teknik analisis kualitatif yang meliputi data *reduction*, *data display*, dan *conclusion*. Hasil penelitian diperoleh bahwa dengan bimbingan guru yang intensif pada mata pelajaran matematika materi bilangan cacah hasil belajar siswa kelas IIB SDN Kebaharan 1 meningkat.

Kata Kunci: *Miskonsepsi, Matematika, Bilangan Cacah*

Abstract

This study aims to determine the Maths Misconceptions on the Place of Numbers of Grade II Students. This research was conducted in class II of SDN Kebaharan 1, Serang District. This research used descriptive qualitative method. The data sources in this study were grade IIB students. The research subjects were grade IIB students. Data collection techniques through essay tests, interviews, and documentation. The validity of the research data uses qualitative analysis techniques which include data reduction, data display, and conclusion. The results showed that with intensive teacher guidance in the subject of mathematics, the learning outcomes of students in class IIB SDN Kebaharan 1 increased.

Keywords: *Misconceptions, Maths, Interspersed Numbers*

INTRODUCTION

The ability required in dealing with 21st century skills is the ability to solve mathematical problems (Primayana, 2020). Critical thinking skills can be developed by students through problem solving activities in school, society, and everyday life (Rahmawati et al., 2020). Thus, it is very important that problem solving skills are introduced to students to develop critical thinking skills (Nuriyah et al., 2020). Students in mathematical problem solving ability still experience many difficulties (Özreçberoğlu & Çağanağa, 2018). Mathematical problem solving ability is the ability to understand problems, develop strategies, make strategies, and reflect (Siskawati et al., 2022).

Mathematics learning has a very important role in everyday life. Individuals who study mathematics are taught how to argue critically, creatively, and with initiative. The government has established mathematics as a compulsory subject that must be studied since elementary school. One of the materials taught in math class is the concept of integers. The main task of a teacher is to carry out teaching activities effectively in accordance with the time and attendance at school. Therefore, every educator must prepare learning carefully to enable students to receive and understand the material more easily and thoroughly (Suryana, 2015).

In the context of learning, the role of educators in determining the methods to be applied has great significance. The main responsibility of an educator is to deliver teaching material to students with the aim that the material can be understood and absorbed optimally. The learning method functions as an instrument to achieve learning objectives; therefore, the more effective the method used, the higher the chance of success in achieving these objectives. Thus, the application of appropriate teaching methods and the implementation of systematic learning stages will support students in receiving and understanding the material presented better (Eli, 2020).

In the learning process, there are important roles taught by teachers, teaching materials, and supporting environments, each of which has its own purpose. Teachers play a role in creating a conducive learning atmosphere to guide students towards achieving predetermined teaching objectives. In carrying out this task, teachers utilize teaching materials as a medium that supports the effectiveness of delivering material to students (Yuni, 2015). Learning mathematics in elementary school requires hands-on activities that can lead to Learning mathematics at the elementary school level requires hands-on activities that support understanding of mathematical concepts. Therefore, educators are required to design and implement a learning process that is able to equip students with skills in applying mathematics and mathematical thinking in the context of everyday life.

The learning process must be adapted to the relevant curriculum and support optimal student development. Understanding of mathematical concepts. Therefore, teachers must be able to create and prepare students to have the ability to use mathematics and mathematical thinking models in everyday life, namely curriculum learning that is in accordance with optimal student growth and development.

By studying mathematics, one can hone their logical and critical thinking skills, where they are constantly confronted with the need for in-depth assessment and reflection. For example, with the concept of multiplication, one can estimate the number of cookies in a box without having to count them one by one manually so that math makes everyday life easier (Esi, 2016). Concept understanding refers to learners' ability to interpret material independently using their own expressions without relying entirely on textual references. Learners who can relate one concept to another indicate that they have reached an adequate level of understanding of the concept (Priyatna et al., 2019).

According to (Viviana et al. 2019), concepts in mathematics are interconnected, where one concept becomes the basis for the formation of the next concept. Therefore, to be able to master more complex concepts, students need to understand the basic concepts first to avoid misconceptions. Misconceptions arise when there is a mismatch between the understanding of concepts that students have and concepts that have been scientifically agreed upon by experts, or when students cannot connect basic concepts with advanced concepts appropriately (Amaliyah et al., 2022). The presence of these misconceptions can hinder learners' understanding of new concepts that are the development of these basic concepts.

One of the mathematical concepts taught at the elementary school level is the concept of integers. Understanding this concept can be achieved by learners through mastery of the placement of integers. The concept of addition and subtraction is a fundamental basis for students in learning advanced concepts, even up to the level of higher education (Sari et al., 2022). However, facts in the field show that not all learners at the primary school level are able to optimally understand the concepts of addition and subtraction, especially related to the placement of integers. Some learners still face difficulties in solving problems involving the placement of integers.

The problem of misconceptions in understanding the placement of integers was also found in a number of grade II students at SDN Kebaharan 1, Serang District. This was revealed through the results of evaluation of division questions and interviews with grade II teachers at the school. Based on these findings, a more in-depth study is needed to identify the factors that cause misconceptions in the placement of integers. Therefore, this

study aims to comprehensively analyze the misconceptions experienced by one of the grade II students at SDN Kebaharan 1, Serang Subdistrict, especially in solving problems related to the placement of integers.

RESEARCH METHOD

Researchers conducted this research using descriptive research methods with a case study research form. Qualitative descriptive research is used to describe in depth the misconceptions that occur in students related to math skills (Malikha & Amir, 2018). This research was conducted at SDN Kebaharan 1, Serang District. Of the 34 students who were given division problems in class IIB at SDN Kebaharan 1 Serang Subdistrict, there were several students who experienced misconceptions about small numbers. Therefore, the subject studied in this study amounted to one learner. The object of this research is the form of misconceptions and the causes of misconceptions that occur in these students.

To obtain research data, data collection techniques conducted by researchers through math ability tests and interviews. The mathematics ability test given was in the form of a written essay test on integers, while the interview stage carried out was in the form of an interview with the IIB class teacher at SDN Kebaharan 1, Serang District, and an interview with the subject under study using an interview guide to explore more in-depth information from the results of the written test and the causes of his misconceptions. The data analysis technique used is a qualitative analysis technique according to Miles and Huberman which includes data reduction, data display, and conclusion (Sugiyono, 2019).

RESULTS AND DISCUSSION

The results of observations made of grade 2 B students of SDN Kebaharan 1 regarding the misconceptions of determining the place of enumerated numbers up to 100 show some incorrect understanding by students.

The following is some documentation of the results of observations of working on questions from students in class 2 B SDN Kebaharan 1:

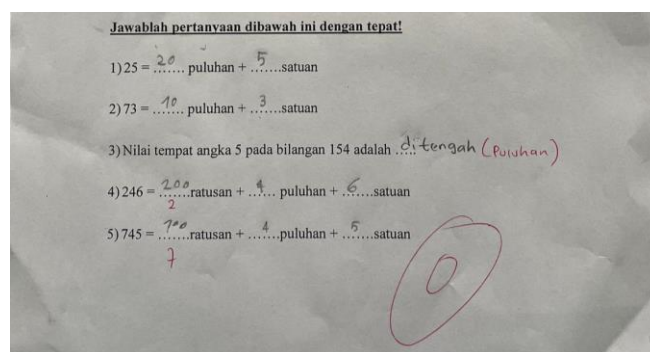


Figure 1: Misconceptions of Student P

Based on the results of P's answers, the misconceptions experienced by P are related to determining the place of numerical numbers up to 100. Of the five problems given, P did all five wrong. The error in the answer to question number 1 lies in the concept of number placement. In problem number 1, the number 25 determines the placement of tens and units. P answered 20 in the placement of the tens number which should have been 2 without writing the number 0 after it.

The answer error for question number 2 lies in the concept of number placement. In question number 2, the number 73 determines the placement of numbers and units, P answers 70 in the placement of tens numbers which should have been answered with 7 without writing the number 0 after it.

The wrong answer to question number 3 lies in the concept of number place value. In question number 3 is to determine the name of the number from 154, mentioning the value of the number 5. P answered "in the middle" which should have been tens.

The error in answer number 4 lies in the concept of number place value. In question number 4 is the number 246, determining the placement of hundreds, tens and units. P answered 200 hundreds, 4 tens and 6 units which should have been answered in hundreds numbers only writing the number 2 without writing the number 0 after it. The error in answer number 5 lies in the concept of number place value. In question number 5 is the number 745, determining the placement of hundreds, tens and units. P answered 700 hundreds, 4 tens and 5 units, P should have answered the hundreds number by only writing the number 7 without writing the number 0 after it.

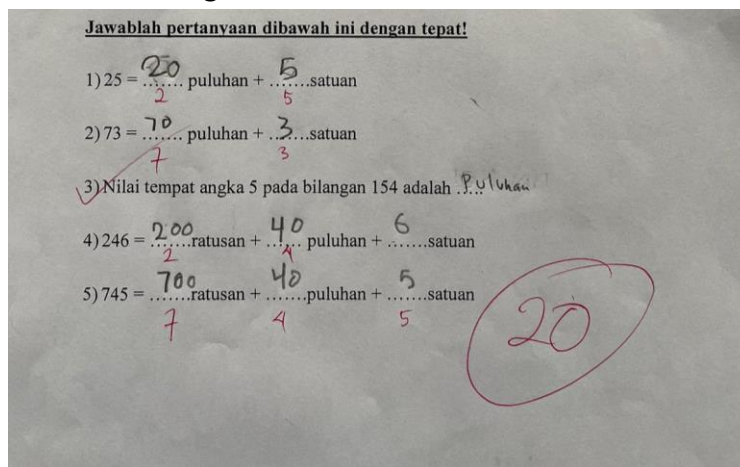


Figure 2: Misconceptions of Student Z

The error in the answer to question number 1 lies in the concept of number placement. In question number 1, the number 25 determines the placement of tens and units. Z answers 20 in the placement of the tens number which should be 2 without writing the number 0 after it.

The error in the answer to question number 2 lies in the concept of number placement. In question number 2, the number 73 determines the placement of numbers and units, Z answers 70 in the placement of tens which should be 7 without writing the number 0 after it.

The error in answer number 4 lies in the concept of number place value. In question number 4 is the number 246, determining the placement of hundreds, tens and units. Z answered 200 hundreds, 40 tens and 6 units which should have been answered in the hundreds number only writing the number 2 without writing the number 0 after it and Z wrote the answer in the tens number which is 40, Z should have answered the number 4 without writing the number 0 after it.

The error in answer number 5 lies in the concept of number place value. In question number 5 is the number 745, determining the placement of hundreds, tens and units. Z answered 700 hundreds, 40 tens and 5 units which should have been answered in the hundreds number only writing the number 7 without writing the number 0 after it and Z wrote the answer in the tens number which is 40, Z should have answered the number 4 without writing the number 0 after it.

Grade 2 students tend to be at the concrete stage of cognitive development, according to Piaget's theory, so they find it difficult to understand concepts that are too abstract, such as counting numbers, without the help of props. They find it easier to understand math concepts if they are connected to real objects, such as physical objects that they can count and touch. Learning that is too theoretical without the application of everyday contexts can make it difficult for students to relate the concept of small numbers to real situations. For example, without examples of using numbers in everyday activities such as counting toys or fruit, this concept feels irrelevant and difficult for students to understand. In learning integers, visual aids such as number blocks, marbles or number lines are very helpful. If the learning method does not involve adequate visual or manipulative aids, students may feel confused in understanding the placement and operations on integers.

Grade 2 students usually have limitations in terms of concentration and memory. If integers are taught in a straightforward manner without appropriate stages for their concentration, then students may feel overwhelmed or bored, making it difficult to remember the basic concepts of integers. Students in grade 2 have varying levels of understanding and learning speed. When teachers are unable to give sufficient attention to students who need more time to understand the concept of integers, they may fall behind their peers. Home learning support is also very important in students'

understanding. If students do not have assistance to practice or revisit the concept of integers at home, their understanding may be limited to what is learned at school.

CONCLUSIONS

Some grade 2B students at SDN Kebaharan 1 still face misconceptions in understanding the place value of integers. Frequent errors include misconceptions in determining the place value or position of the numbers that make up a number, which leads to errors in understanding procedures, performing calculations, and separating numbers into hundreds, tens and units. Students tend to have an alternative concept of three-digit and two-digit numbers, reading them as separate numbers from their place value. In addition, there are other alternative understandings related to the process of adding hundreds, tens, and units. Students are also unable to interpret the term "hundreds" as a new set of one hundred units, or "tens" as a new set of ten units. With intensive guidance from the teacher, learning mathematics on the material of numerical numbers in class II shows an increase in student learning outcomes.

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