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Analysis of Students' Learning Difficulties in Subtracting Whole Numbers in Grade 3 Elementary School

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ABSTRACT

This research aims to analyze the learning difficulties of grade 3 elementary school students in understanding the material for subtracting whole numbers. Difficulties experienced by students include conceptual, procedural, calculation errors, and difficulties in solving word problems. Factors causing these difficulties include internal aspects, such as low understanding of mathematical concepts, lack of motivation, and concentration problems, as well as external factors, such as less varied learning methods, minimal use of interactive media, and lack of learning environment support. The results of the analysis show the importance of implementing innovative learning strategies, such as contextual approaches, using teaching aids and interactive technology, as well as providing individual guidance and collaboration with parents. With these efforts, it is hoped that students can understand the concept of subtracting whole numbers better and improve their overall mathematical abilities.

Key Word
Learning Difficulties, Subtraction of Whole Numbers, Grade 3 Elementary School Students, Difficulty Factors, Learning Strategies.

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INTRODUCTION

Mathematics is one of the basic subjects that plays an important role in the development of students' logical and systematic thinking abilities (Dalila et al., 2024); (Afifah & Nurhabibah, 2024). In elementary school, one of the materials taught from an early age is number operations, including subtraction of whole numbers. This material becomes the foundation for students' understanding of more complex mathematical concepts at the next level of education. However, in practice, many grade 3 elementary school students have difficulty understanding the concept of subtracting whole numbers (Rahmatin & Marzuki, 2022); (Mandasari & Rosalina, 2021).

Learning difficulties in subtracting whole numbers can appear in various forms, such as errors in understanding concepts, inability to apply correct procedures, and errors in carrying out calculations (Dewi et al., 2024); (Hasibuan et al., 2024). Apart from that, students also often experience obstacles in solving story problems that involve

subtraction due to difficulties in interpreting the context of the problem. This shows that there are challenges in the learning process that must be addressed immediately (Unaenah et al., 2022); (Adhytia et al., 2024); (Zakia et al., 2024).

Various factors can influence students' learning difficulties, both from within the student, such as the level of understanding of concepts, motivation, and concentration, and from outside, such as less effective teaching methods, minimal use of learning media, and an unsupportive learning environment. Therefore, it is important for educators to understand the types of difficulties experienced by students and the factors that cause them, so that more effective learning strategies can be implemented (Shah et al., 2023); (Diyana & Hidayati, 2024); (Djatmika & Praherdhiono, 2024).

This research aims to analyze students' learning difficulties in subtracting whole numbers in grade 3 of elementary school. With this analysis, it is hoped that the right solution can be found to help students overcome their learning obstacles, increase their understanding of mathematical concepts, and encourage optimal achievement of learning goals.

RESEARCH METHOD

1. Types of research
   This research uses a qualitative descriptive approach which aims to describe and analyze students' learning difficulties in whole number subtraction material in grade 3 of elementary school. This method was chosen to identify the types of difficulties experienced by students, the factors causing them, and solutions that can be applied.
2. Research Subjects
   The subjects of this research were grade 3 students at the Koto Tuo 47 State Elementary School with a total of 27 students selected as research samples using purposive sampling techniques, namely students who showed learning difficulties based on the results of initial tests and teacher observations.
3. Research Location and Time
   This research was conducted at SD N 47 Koto Tuo where the subjects studied for one month, including the stages of data collection, analysis and preparation of research results reports.
4. Research Instrument
   The research instruments used include: 1) Diagnostic Test: Whole number subtraction questions to identify the type of student difficulty. 2) Interview: Used to obtain in-depth information from students and teachers about the factors that influence learning difficulties. 3) Observation Sheet: To record student activities during mathematics learning, including how they solve subtraction problems. 4)

Documentation: Collect supporting data such as student test scores and teacher learning plans.

5. Research Procedures

   The research was carried out through the following stages: a) Preparation Stage: Developing research instruments (diagnostic tests, interview guides, and observation sheets) then testing the instruments to ensure validity and reliability. b) Implementation Stage: Carrying out diagnostic tests on students to identify learning difficulties. Observing the mathematics learning process in class. Conduct interviews with students to find out the factors causing their difficulties. Interviews with teachers to understand the learning strategies implemented. c) Data Analysis Stage: Processing diagnostic test results to group types of student difficulties. Analyze data from interviews and observations to find factors causing difficulties. Compares data from multiple sources to ensure accuracy of findings. d) Reporting Stage: Compile a report on research results based on the data that has been analyzed. Provide recommendations to overcome student learning difficulties.

6. Data Analysis Techniques

   Data were analyzed using descriptive analysis techniques, with the following steps: a) Data Reduction: Filtering data that is relevant to the research objectives. b) Data Presentation: Arranging data in the form of tables, graphs, or narratives to facilitate interpretation. c) Drawing conclusions: Concluding the types of student difficulties, causal factors, and effective strategies for overcoming these problems.

7. Data Validity

   To ensure data validity, this research uses source and method triangulation techniques, namely comparing the results of diagnostic tests, interviews, observations and documentation to obtain consistent and accurate data.

RESULT AND DISCUSSION

This research produces data regarding the learning difficulties of 3rd grade elementary school students in understanding the material for subtracting whole numbers. The following are the main findings based on data analysis from diagnostic tests, interviews, observations, and documentation:

1. Types of Learning Difficulties

   Diagnostic test results show that students experience several major difficulties:

   a. Conceptual Errors (30% of students): Students do not understand that subtraction is the opposite of addition. Most students have difficulty understanding the relationship between numbers in subtraction.

b. Procedural Errors (40% of students): Incorrect ordering of numbers when subtracting sequentially. A carrying error occurs when the value in the ones place is less than the number being subtracted.
c. Calculation Error (20% of students): Inability to perform basic operations, such as subtracting small numbers from large numbers, especially without aids such as fingers or concrete objects.
d. Difficulty in Story Problems (10% of students): It is difficult to convert information from word problems into appropriate mathematical operations.

2. Factors Causing Difficulties

Interview and observation data indicate that the following factors contribute to student difficulties:

a. Internal Factors: Low understanding of basic mathematical concepts. Lack of student interest and motivation towards mathematics. Anxiety or fear of being wrong in answering questions.
b. External Factors: The dominant learning method still uses lectures without teaching aids. Lack of variety of learning media, such as interactive games or concrete aids. Minimal learning support from the family environment.

3. Observation of the Learning Process

From the results of observations, it appears that students who experience difficulties tend to be passive during learning. They often need direct guidance from the teacher to solve subtraction problems, especially compound problems.

Discussion

The results of this research indicate that students' learning difficulties in subtracting whole numbers are not only caused by students' ignorance, but also by less than optimal learning approaches. Some things that can be discussed further are:

1. Conceptual and Procedural Errors

   Conceptual and procedural errors reflect students' lack of in-depth understanding of subtraction operations. This is most likely caused by the lack of use of concrete tools that can help students understand concepts visually. For example, the use of real objects such as buttons or sticks can help students understand the "borrowing" process in nested subtraction.
2. Lack of Basic Training

   Calculation errors often occur because students have not mastered basic math facts (such as 7 - 4 or 15 - 8). Repeated and gradual practice can help students correct these errors.
3. Difficulty in Story Problems

   This difficulty shows that students are not yet skilled at connecting mathematical concepts with real situations. Contextual learning methods, such as using stories that are relevant to everyday life, can be a solution to improve this ability.

4. The Role of Teachers and the Environment
   Observations show that teaching methods are still traditional, with teachers explaining more verbally without involving interactive media. Apart from that, parental involvement in supporting students' learning at home is also still low.

CONCLUSION

Based on the research results, it can be concluded that 3rd grade elementary school students at SDN 47 Koto Tuo experienced various difficulties in understanding the material for subtracting whole numbers. These difficulties include:

1. Conceptual Error: Students do not yet understand subtraction as an inverse operation of addition, and are less able to relate the concept of subtraction to real situations.
2. Procedural Error: The main difficulty lies in nested subtraction, especially in the process of "borrowing" a number from a place of higher value.
3. Calculation Error: Inability to perform simple subtraction operations due to lack of mastery of basic mathematical facts.
4. Difficulty in Story Problems: Students face challenges in interpreting word problems and turning them into correct subtraction operations.

Factors that cause learning difficulties come from internal aspects, such as low understanding of concepts and student motivation, as well as external factors, such as less varied learning methods, minimal use of teaching aids, and lack of support from the family environment.

This research emphasizes the importance of using innovative learning strategies, such as contextual approaches, using interactive media, and providing special guidance to students who are having difficulties. By implementing this solution, it is hoped that students can understand the concept of subtracting whole numbers better, so that learning mathematics becomes more effective and enjoyable.

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