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Analysis of Students' Difficulties in Understanding the Concept of Summation in Grade II Students of UPTD State Elementary School 124407 Pematangsiantar

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Abstract

This study aims to analyze students' difficulties in understanding the concept of summation, identify the factors that cause students' difficulties, and find out teachers' efforts in overcoming these difficulties in grade II students of UPTD State Elementary School 124407 Pematangsiantar. This study uses a qualitative approach with a descriptive type of research. The subject of the study is grade II students. Data collection techniques are carried out through observation, tests, interviews, and documentation. The results of the study show that students have difficulties in several addition indicators. The difficulty of the technique of storing numbers was experienced by 19 students (79.2%), the addition of hundreds by 18 students (75%), the addition of stacked by 17 students (70.8%), the addition of the addition story by 14 students (58.3%), the addition of tens by 8 students (33.3%), and the sum of units by 3 students (12.5%). These difficulties can be seen from errors in determining place values, arranging numbers, doing stacked additions, and using storage techniques. Causative factors include lack of understanding of concepts, lack of thoroughness, easy forgetfulness, low interest in learning, lack of practice at home, and suboptimal learning assistance. Teachers' efforts are carried out through re-explanations, giving examples, gradual exercises, individual guidance, and asking questions. Thus, gradual learning, repetitive exercises, and cooperation between teachers, students, and parents are needed to help overcome students' difficulties in understanding the concept of addition.

Keywords: *learning difficulties, summation concept, Grade II students, test results, interviews*

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INTRODUCTION

Mathematics learning in elementary school plays a strategic role in forming the basis of logical, systematic, and analytical thinking skills. At this level, learning focuses not only on results, but also on understanding basic concepts that are the foundation for material at a higher level. One of the basic concepts that students must master is the addition calculation operation, because addition is the basis for learning subtraction, multiplication, and division. Understanding concepts allows students not only to solve problems, but also to understand the meaning of each process carried out. This is in line with the view of constructivism which views knowledge as the result of students' active construction through meaningful learning experiences. However, in practice, there are still many elementary school students who have difficulty understanding the concept of addition. Previous research shows that grade II students still experience difficulties, especially in storage techniques, understanding place values, and calculating accuracy (Putri & Wandini, 2023). Other difficulties are errors in writing numbers and difficulty understanding story-form problems due to low reading skills (Tauqifa et al., 2023). Difficulties in implementing the storage (carrying) technique are also found in grade II students because students have not been able to manage grades that exceed units to the next place value (Rosanti et al., 2022). Low understanding of concepts and lack of practice are also cited as causes of students' difficulties in summing (Julaiha, 2024).

Difficulties in learning mathematics are influenced by internal and external factors. Internal factors include cognitive ability, interest, motivation, and reading ability, while external factors include less varied learning methods, limited media, and less supportive learning environments. Low interest in learning, the assumption that mathematics is too difficult, and boredom are also cited as causes of students' difficulty understanding mathematical concepts (Unaenah et al., 2023). On the other hand, grade II students are at a concrete operational stage so they need real objects or visual media to understand abstract concepts such as summation. According to Bruner's theory, mathematics learning needs to be done gradually from the enactive, effective stage

Initial observations in grade II UPTD SD Negeri 124407 Pematangsiantar showed that many students had difficulty working on stacked addition, especially when they had to arrange numbers down according to their place value and save numbers. Initial interviews with grade II teachers reinforced these findings: only a small percentage of students had understood summation, while most others still had difficulties, especially in stacked summing and numbers tens and hundreds. Some students were also still counting with their fingers or one at a time, which showed that the understanding of the concept of addition was still at the basic stage. If these difficulties are not addressed immediately, student learning outcomes will be low and students will experience obstacles in more complex math materials.

Based on this description, an in-depth analysis is needed to find out the form of difficulty experienced by students, the causative factors, and teachers' efforts to overcome them. This study aims to (1) analyze students' difficulties in understanding the concept of summation, (2) identify the factors that cause these difficulties, and (3) find

out the efforts made by teachers to overcome them in grade II students of UPTD State Elementary School 124407 Pematangsiantar. The results of the research are expected to be input for teachers in designing learning strategies that are in accordance with student characteristics and for schools in improving the quality of mathematics learning.

METHOD

This study uses a qualitative approach with a type of descriptive research. The qualitative approach was chosen because the research wants to understand the phenomenon in depth, namely how students understand the summation problem, which parts are confusing, and how they solve it, rather than just assessing the right or wrong answers. The descriptive approach is used to describe the actual conditions in the field without manipulating the situation. The research was carried out at UPTD SD Negeri 124407 Pematangsiantar, Jalan Singosari, Bantan Village, West Siantar District, in the 2025/2026 school year, from May to June 2026. The subjects of the study were all grade II students totaling 26 people (13 boys and 13 girls) as well as teachers of grade II. The subjects were taken using a total sampling technique because all grade II students were sampled.

Data was collected through four techniques. First, observation using observation sheets to observe the understanding of place values, difficulty in adding numbers, difficulty storing numbers, summing large numbers, counting processes, story problems, and student activity during learning. Second, a written test in the form of a short fill consisting of 10 questions with indicators of unit summation, tens, stacked summation, number storage techniques, summation of hundreds, and summation story questions. Third, semi-structured interviews with teachers (eight questions) and students (nine questions) regarding their preferences for mathematics, summing ability, confusion when storing numbers, understanding of place values, teacher assistance, and learning habits at home; one student was absent from the interview due to illness. Fourth, documentation in the form of photos of activities, interview recordings, and student work results as supporting data.

Data was analyzed gradually from data collection to the end of the research through three stages, namely data reduction, data presentation, and conclusion drawing (Sugiyono, 2019). Reduction was carried out by selecting and grouping data based on three research focuses, namely student difficulties, causative factors, and teachers' efforts. Data were presented in the form of narrative descriptions and tables, then concluded by comparing findings from observations, tests, interviews, and documentation. The validity of the data was tested by source triangulation (comparing student and teacher data) and technical triangulation (comparing the results of observations, tests, interviews, and documentation.

RESULTS AND DISCUSSION

Students' Difficulties in Understanding the Concept of Summing

The results of the observation showed that students' ability to understand the concept of addition varied. Some students were able to follow the learning and do the problem well, while others still had difficulties, especially in stacked addition, storage techniques, and

number placement based on the place value of units, tens, and hundreds. Some students seemed hesitant to determine the number that should be saved and continue it to the next place value. The recapitulation of the test results is presented in the Table

Table 1. Summary of students' difficulties based on summation indicators

Yes	Indicator	Number of students who are struggling	Percentage
1	Technique of saving numbers	19 students	79,2%
2	Summing the number of hundreds	18 students	75%
3	Stacked summing	17 students	70,8%
4	About the summation story	14 students	58,3%
5	Summing up dozens	8 students	33,3%
6	Unit summing	3 students	12,5%

Table 1 shows that students' difficulties increase as the complexity of the operation increases. Unit summing is the indicator with the lowest difficulty (12.5%), so most students have understood simple summation. In the addition of tens, difficulties were experienced by 8 students (33.3%), generally related to the placement of place values between tens and units and the accuracy of calculation.

Difficulty increased sharply in stacked summing (70.8%). Most students were not able to compile the completion steps systematically, still misdetermined the order of work, and confused about arranging numbers according to their place values. The greatest difficulty was found in the technique of storing numbers (79.2%): students were confused when the result of adding units exceeded nine, did not understand the number that should be saved to the next place value, and often forgot the storage step so that the final result was wrong. In the number of hundreds, 18 students (75%) had difficulty because they were not able to distinguish the place values of units, tens, and hundreds, so the order of addition was incorrect. Story questions were experienced by 14 students (58.3%); errors did not only occur in calculations, but also in understanding the content of the problem and determining the correct operation.

These findings are in line with the research of Putri and Wandini (2023) who found that the difficulties of grade II students in summing are related to understanding place values, working procedures, and the calculation process. The difficulty of saving techniques is in accordance with the findings of Rosanti et al. (2022), while difficulties in the number of hundreds and story problems are in line with Tauqifa et al. (2023) who reported difficulties in recognizing place values, writing numbers, counting carefully, and understanding story problems. These results also support Bruner's view that students who do not understand basic concepts concretely will have difficulty in more complex counting operations. Thus, students' difficulties are not solely caused by the ability to calculate, but also by the understanding of place values, mastery of storage techniques, and the ability to understand the content of story problems.

The results of interviews with students support the test data. Most students admitted that it was difficult to add larger numbers, especially in stacked summing with the saving technique. Some students did not like mathematics because they thought it was difficult,

and some were still confused about distinguishing units, tens, and hundreds. A number of students also admitted that it was easy to forget the steps to save numbers so that the addition results were wrong.

Difference between Test and Interview Results

The study also found that the ability shown in the interview was not always the same as the written test results. There were students who answered all the test questions correctly, but in the interview felt confused and lacked confidence when explaining how to do stacked summation. On the other hand, there were students who were able to explain the differences in units, tens, and hundreds as well as the steps of stacked summing orally, but still made mistakes on the written test. These findings show that the answers to the short-fill test do not fully describe the student's understanding of concepts. The test shows the ability to apply concepts to problem solving, while the interview reveals students' conceptual understanding and confidence. Therefore, the assessment of learning difficulties is not enough using one instrument, and the use of tests along with interviews provides a more complete picture.

Factors Causing Student Difficulties

Based on interviews with teachers and students, students' difficulties are affected by a combination of internal and external factors.

Internal factors include (1) lack of understanding of the concept of place values, so that students have difficulty determining the position of numbers in stacked summation; (2) difficulty understanding storage techniques; (3) lack of thoroughness and haste in calculating; (4) easy to forget the steps of addition; (5) lack of focus during learning, as expressed by teachers and some students; and (6) low interest in learning because mathematics is considered difficult. External factors include (1) lack of practice at home, because some students only study when there is homework or before exams; (2) suboptimal learning assistance, even though some students are guided by their fathers, mothers, or older brothers; and (3) students' limitations in understanding the teacher's explanations, including the embarrassment to ask questions when they do not understand.

These findings are in accordance with Slameto's theory that learning difficulties are influenced by internal factors, such as intellectual ability, interest, motivation, and readiness to learn, as well as external factors from the family, school, and learning process. The low interest and assumption that mathematics is difficult is also in line with Unaenah et al. (2023), while the lack of practice is in line with Julaiha (2024).

Teachers' Efforts in Overcoming Students' Difficulties

The homeroom teacher of grade II has made several attempts. First, the teacher gives a spark question that is close to daily life, for example counting the number of students, tables, and chairs in the class. Second, the teacher gives repeated and gradual practice questions so that students get used to determining the place values of units and tens and

write them down correctly. Third, the teacher uses concrete learning: students are divided into small groups, group objects such as marbles, straws, or chopsticks, tie ten objects as tens, and count the rest as units. Fourth, the teacher tries to increase students' confidence. In addition, the teacher provides re-explanations, simple examples, individual guidance, and the opportunity to ask questions.

However, interviews with students show that these efforts are not fully optimal. Some students still do not understand explanations because they lack focus, forget, or are embarrassed to ask questions. This shows that the success of learning is influenced not only by teachers' strategies, but also by students' readiness and motivation. Summing learning in grade II needs to be supported by more varied concrete media, gradual exercises, intensive mentoring for students who are still struggling, and strengthening the concept of place values before stacked addition and storage techniques are taught. In addition, cooperation between teachers, students, and parents is needed so that the practice takes place continuously at school and at home.

CONCLUSION

Based on the results of the research on the Analysis of Students' Difficulties in Understanding the Concept of Summation in Grade II Students of UPTD State Elementary School 124407 Pematangsiantar, it can be concluded as follows.

1. **Difficulties experienced by students in understanding the concept of addition** include difficulties in performing stacked additions, especially in storage techniques, difficulties in understanding the concept of place values (units, tens, and hundreds), difficulties in solving the addition of hundreds, and difficulties in solving addition story problems. Based on the results of tests and interviews, most students still make mistakes when they have to save numbers in stacked summing and determine the value of the number place so that the calculation results are not accurate.
2. **The factors that cause students' difficulties** consist of internal factors and external factors. Internal factors include lack of understanding of the concept of place value, difficulties in storage techniques, lack of precision when calculating, easy to forget the addition steps, and low interest in learning mathematics. Meanwhile, external factors include a lack of practice at home, suboptimal learning assistance, lack of courage for students to ask questions when experiencing difficulties, and there are still students who are not able to understand the teacher's explanation optimally.
3. **Teachers' efforts to overcome students' difficulties** are carried out through providing re-explanations, gradual practice questions, guidance to students who experience difficulties, and providing opportunities for students to ask questions during the learning process. However, based on the results of the interviews, these efforts still need to be supported by

the use of more concrete learning media, more varied exercises, and good cooperation between teachers and parents so that students receive continuous learning assistance both at school and at home.

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